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COMPARATIVE SIOUAN I

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0. Preface
1. Siouan languages, groups, and phonemic systems

0. This paper treats the comparative phonology and the phonological development of the Siouan languages. Morphophonemic and morphological problems are not considered. Hence, all starred forms* are reconstructions of specific phonological characteristics; in no instance was the reconstruction of complete morphemes attempted, nor was any effort made to explain differences of a morphological nature between cognates of several daughter languages.

The material for this study was obtained from many different sources, and its accuracy and general reliability is by no means uniform. Fortunately, it can be said that most of the source material is very reliable; only in one case—the word lists collected by Maximilian zu Wied-Neuwied—did we have reason seriously to doubt the phonetic accuracy in the transcription of a good many words. It seemed advisable, therefore, to mark all cognates derived from this source by the designation (max) after the cognate.

All material which has appeared in publication and such material as is available in manuscript has been listed in the bibliography at the end of the paper. I am indebted to the American Philosophical Society for the loan of four manuscripts from the Franz Boas Collection of American Linguistics.

By far the largest amount of source material was generously turned over to me by C. F. Voegelin who also first suggested that I attempt this study. His material, consisting of thousands of file cards and slips, represents partly the result of field trips (Hidatsa, Dakota, Iowa-O o), partly the result of months of painstaking research on manuscripts now held by the Bureau of American Ethnology. For his generosity and for the many hours spent in giving advice and proffering valuable criticism I wish to express my heartfelt appreciation. I also wish to express my gratitude to H. V. Velten who co-directed this dissertation, and whose invaluable advice in the field of comparative linguistics proved to be a decisive factor in the completion of the paper. Further acknowledgment of indebtedness is extended to Thomas A. Sebeok for advice and material on Winnebago, to George Herzog, and to all other members of the joint Ethno-linguistic and Linguistic Seminar of Indiana University. Their generous and constructive criticism was valuable and welcome.

1.0. The Siouan languages included in this comparative study are, from northwest to southeast: Crow, Hidatsa, Mandan, Dakota, Winnebago, Čiwere, Omaha-Ponca, Osage, Kansa, Quapaw, Ofo, Biloxi, Tutelo, and Catawba.

On the basis of phonological and lexical similarities these languages may be grouped into seven distinct groups: 1 Crow-Hidatsa, 2 Mandan, 3 Dakota, 4 Čiwere-Winnebago, 5 *θ*egiha, 6 Ohio Valley Siouan, 7 Catawba. The assumption that these groups represent the first separations from the parent Proto-Siouan language, followed by later splits within each group, is implicit in this classification.

In the following sections (**1.1.** etc.) each group and the phonemes of individual languages will be discussed briefly.

1.1.1. The Crow-Hidatsa group consists of two languages, Crow and Hidatsa; their phonemic systems are not identical, but otherwise these languages show little differentiation. Crow may be said to show most of the innovations in the phonology; on the other hand, the series of long consonants in Hidatsa is definitely of recent origin, more recent, at any rate, than the split into two separate languages.

The following list illustrates the close relationship between Hidatsa and Crow; in citing, the Hidatsa form precedes the Crow form which is followed by English translation for both: cí·ri, ši·re *yellow*; i·kikúac, ikukú *to hear*; rá·ta, rá·se *heart*; šipišác, šipite *black*; ihtíac, isá·te *big*; rápuxic, rápxi *to bite*; tó-ohic, šú·ak *blue*; icu·ká, icú·ke *younger brother*; hu·c, hu·k *to come*; riš·íc risúa *to dance*; te·c, še·k *dead*; wašúka, miské *dog*; ru·tíc, ruší *to eat*; ištá, ište *eye*; i·tá, i·sé *face*; cára, táre *fat, lard*; wíra-a, wiré *fire*; íci, íce *foot*; re·c, re· *to go*; šá·ki, išce *hand*; a·htú, a·šúa *head*; wirúxi murúxe *ice*; ú·waca, ú·wate *iron*; apišá, apté *liver*; rá·xu, rá·xe *lungs*; pá·kiri, pa·cire *to push*; he·c, he·k *to say*; rú·pa, rú·pka·te *two*; arapé·c, arapé *to kick*; atí, ašé *house*; wacé, wacé *man*; apá, ahpé *nose*; wirá, waré *wood, tree*; ší·pa, ší·pe *intestines*; iríc, iri *to live*; ré·ši, re·še *tongue*; wirí, wire *water*; pat·íc, pašík *to fall*; iripíc, irápi *to be fat*; ixúax·a, išú·še *knee*; rúhtiš·ic, rucíre *to touch*.

The phonemes of Hidatsa and Crow are listed in the following two sections.

1.1.2. The consonants of Hidatsa[1] are: stops, p, p·, t, t·, c, c·, k, k·; fricatives, š, š·, x, x·; aspirate, h; and voiced continuants, w, r.

/w/ occurs in two allophones, [m] initially, otherwise [w]. /r/ is heard as [n] initially, as [r] in all other positions.

Vowel phonemes of Hidatsa are i, e, a, o, u and diphthongs ia, ua, ui. Both length and stress are phonemic.

1.1.3. The consonant phonemes of Crow are: stops, p, t, c, k; fricatives, s, š, x; aspirate, h; nasals m, n; and w, r.[2]

Stops are usually aspirated fortis, but unaspirated in clusters. /k/ occurs in three allophones: following front vowels it is [ky]; it is heard as [gy] whenever preceded by /c/ or /š/; otherwise it is [k].

Initial /w/ and /r/ are heard as [b] and [d]; nasals /m/ and /n/ are only weakly nasal in initial position.

Crow vowel phonemes are i, e, a, o, u; both stress and length are phonemic.

1.2.1. Mandan and Dakota coincide on many points of comparative phonology, although Mandan is definitely more archaic. However, Mandan and Dakota do not form one distinct group within the Siouan linguistic family.

Dakota (D.), with its main dialects Santee (Ds.), Yankton (Dy.), Teton (Dt.), and Assiniboin (Da.) has two stop series, while Mandan (M.) has preserved the single stop series of Proto-Siouan. For this reason, and because of the great lexical differences between them, Mandan and Dakota are treated as two entirely distinct groups of Siouan.

The separation of Proto-Mandan from the parent language cannot have occurred later than that of Crow-Hidatsa. However, Mandan does not show any special similarities to Crow or Hidatsa.

1.2.2. The consonant phonemes of Mandan[3] are: stops, p, t, k, ʔ; fricatives, s, š, x; aspirate, h; nasals and voiced continuants, m, n, w, r.

Phoneme /r/ is phonetically realized as

[1] Hidatsa phonemes, as given by C. F. Voegelin and Zellig Harris in R. H. Lowie, Hidatsa Texts, Prehistory Research Series of the Indiana Historical Society, vol 1. number 6 (1939).

[2] After R. H. Lowie, The Crow Language UCPAAE 39.1–142 (1941).

[3] Phonemicized from material in E. Kennard Mandan Grammar, IJAL 9 pt. 1.1–43 (1936).

[nd] whenever it follows nasal vowels; in all other positions [r] is heard.

The vowel phonemes of Mandan are: oral, i, e, a, o, u; and nasal, į, ą, ų. Length and stress are phonemic.

1.2.3. The listing of Dakota phonemes presents some difficulties, because of certain phonemic differences in the dialects. We give here the phonemes of Santee Dakota, because most of our data is from this dialect. Stops, p, b, t, d, č, k, ʔ; fricatives, s, z, š, ž, x, γ; aspirate, h; nasals and voiced continuants, m, n, w, y.

Teton Dakota has /l/ instead of Santee /d/ and apparently no /y/; Teton /k/ has an allophone [g] in clusters in which /l/ is the second consonant.

Dakota vowel phonemes are: oral, i, e, a, o, u; and nasal, į, ą, ų. Stress is phonemic[4].

1.3.1. The Čiwere-Winnebago group. This group consists of two languages, Čiwere and Winnebago. Čiwere comprised the mutually intelligible dialects Iowa, Oto, and Missouri, the latter now extinct. This language is to be regarded as more archaic than Winnebago, especially in the treatment of Proto-Siouan clusters. These clusters are usually preserved with slight phonemic changes in Čiwere, while Winnebago preserves the Proto-Siouan phoneme but replaces the cluster with a sequence CVCV. In spite of this difference, both languages show important parallelisms in their respective phonologies. The list of cognates which follows shows the close relationship of Čiwere and Winnebago (with forms cited in that order): úniŋe, huŋak *bean*; xáǰe, xate *large*; wayíŋe, waniǩ *bird*; θéwe, se·p *black*; tó, čo· *blue, green*; wasóse, wašóše *brave*; háǰe, hí·hąte *to dream*; čʔe *to die*, tʔe *dead*; luǰe, wa-ru·č *to eat*; isda, hišǰá- *eye*; sį, šį· *fat*; áǰe, hiąč *father*; mąsų, ma·šų *feather*; úyu, ho·žú *to fill*; kíða, -kiza- *fight*; peǰe, pe·č *fire*; iló, ro·rá *flesh*; hį, hį· *hair*; lé, re *to go*; hįtúgą, híčoke *grandfather*; nąwe, nąp *hand*; náhǰe, nąčgé *heart*; či, či *house*; θléǰe, seréč *tall, long*; wáŋe, wąk *man*; waníį, wani *meat*; luká, nąro·ka *naked*; láye, ra·š *name*; ʔsąke *nine*, hižáki·ra *one*; suǰe, šu·č *red*; é, he *to say*; adá, haǰá *to see*; sáhmą, ša·gówi *seven*; yąwe, nąwą *to sing*; náŋe, miną *to sit*; glégleðe, kerekéreš *spotted*; uláge, ho·rag- *to tell*; gléblą, kerepanaižą *ten*; nąą, nąą *tree, wood*; ní, ni· *water*; θka, ska *white*; hináge, hinúk *woman*; ðí, zi *yellow*; mąðé, -maza- *metal*; bláθge, páras- *flat*; leǰe, re·zí *tongue*; šákwe, hakéwe *six*; xlósge *empty*, šóroš *hole*; háhe, hąxé *night*; siǰe, sič *tail*.

1.3.2. Winnebago[5] consonant phonemes are: stops, p, b, t, č, ǰ, k, g, ʔ; fricatives, s, z, š, ž, x, γ; aspirate, h; nasals and voiced continuants, m, n, w, r, y.

/r/ is phonetically [d] after nasal vowels; it is heard as [r] in all other positions.

Winnebago vowels are: oral, i, e, a, o, u; nasal, į, ą, ų. Both stress and length are marked; they may, or may not, be phonemic. See also the discussion of length and stress in Siouan (chapter 4. below).

1.3.3. Čiwere (Iowa-Oto)[6] consonants are: stops, p, b, t, d, č, ǰ, k, g, ʔ; fricatives, θ, ð, s, x; aspirate, h; nasals, m, n, ŋ; and voiced continuants, w, l, y.

/n/ occurs in two allophones, palatal [ñ] before front vowels, and dental [n] in other positions. /l/ is phonetically realized as [r] between vowels.

Čiwere vowel phonemes are: oral, i, e, a, o, u; nasal, į, ą, ų. Stress is phonemic.

1.4.1. The term θegiha was applied to a

[4] Dakota phonemes after E. Deloria, Dakota Texts, Publications of the American Ethnological Society 14.1–279 (1932); also after F. Boas and E. Deloria, Dakota Grammar, Memoirs of the National Academy of Sciences, vol. 23, memoir 2.1–183 (1939).

[5] Winnebago phonemes are here taken over from A. Susman, The Accentual System of Winnebago, New York (1943); no attempt was made at evaluating Susman's analysis critically.

[6] Čiwere phonemes after W. Whitman, Descriptive Grammar of Ioway-Oto, IJAL 13.233–48 (1947); C. F. Voegelin, A Problem in Morpheme Alternants and Their Distribution, Lg. 23.245–54 (1947).

group of Siouan languages by Dorsey[7], who included under this designation Omaha-Ponca (θegiha), Osage (θegaha), Kansa (Yegaha), and Quapaw (Akansa). Voegelin[8] linked all four together and listed them as dialects of one language. While immediate mutual intelligibility may not actually exist between the members of this group, they seem so close linguistically that we may have a certain amount of neighbor intelligibility which may develop into mutual intelligibility after a short period of acquaintance between speakers of two different dialects. We therefore list them as dialects rather than separate languages. However, there are some phonological differences which seem important from the comparative viewpoint, and which occur in Osage. For the purpose of the comparative study, therefore, we shall treat Osage and Omaha-Ponca as separate units within the θegiha group and list the phonemes of both these dialects.

The following list of cognates illustrates the close relationship of the dialects which constitute the θegiha group of Siouan.

OmP.	*Os.*	*Ka.*	*Qu.*	
mą	mǫ	mą	ma	*arrow*
pede	pece	pyeže	pete	*fire*
mąze	mǫ́θe		maze	*iron*
pa	pa		pahi	*head*
bθaska	bðáðda	blaska		*flat*
mį	mi	mį		*sun*
tu *blue*	tóho *green*	tu *blue*	tu	*blue*
t$^{?}$e	c$^{?}$e	c$^{?}$e	t$^{?}$e	*to die*
θate	ðacé		ðate	*to eat*
topa	dóba	topa	tuwa	*four*
θe	ðe	le		*to go*
ti	ci	ti	ti	*house*
nu	do	du		*potato*
nude	dóce	duje	dute	*throat*
nąba	ðǫba	nompa		*two*
mini	ni		ni	*water*
nuxe	nǫ́xe			*ice*
si	θi	si	si	*foot*
ska	θka	ska		*white*
sinde	θį́ce	sinje		*tail*
zi	θi		zi	*yellow*
sni	hníce	sni		*cold*
sabe	θábe	sabe	sewe	*black*
žide	žuce	žüde		*red*
žą	žǫ		yǫ	*wood*
nąde	nǫ́ce	nąje		*heart*
žabe	žábe	žabe	žabe	*beaver*
θezi	ðéθe	yesa		*tongue*
šna	-šda-	šta		*smooth*
?i	k?i			*to give*
gθeže	gðežé	leže		*spotted*
šape	šape	šape	šape	*six*
kąde	kǫ́ce	kąje		*plum*
hį	hį		hį	*hair*
hoho	ho	hu	hu	*fish*
gθebe	gðebe	lebe		*to vomit*
i	hi	hi	hi	*tooth*
?į	k?į	k?į		*to carry*
?e	k?e			*to dig*
nakade	dakace	dakaje		*hot*
nini	nǫníhi	nanü	tani	*tobacco*

1.4.2. The consonant phonemes of Omaha-Ponca are: stops, p, b, t, d, č, k, g, ?; fricatives, θ, s, z, š, ž, x; aspirate, h; voiced continuants, m, n, w.

Omaha-Ponca vowels are: oral, i, e, a, o, u; and nasal, į, ą. Stress is phonemic.

1.4.3. Osage consonants are: stops, p, b, t, d, c, k, g, ?; fricatives, θ, ð, s, š, ž, x; aspirate, h; voiced continuants m, n, w.

/c/ is a dental affricate, voiceless and lenis. /s/ is heard only in the consonant cluster /sc/.

Osage vowels are: 5 oral vowels, i, e, a, o, u; and two nasal vowels, į, ǫ. Stress is phonemic.

1.4.4. The Kansa and Quapaw material is so scanty that it is impossible at the present time to give the phonemes of these dialects.

1.5.1. The Ohio Valley group of Siouan languages[9] consists of three languages,

[7] J. O. Dorsey, The Ćegiha Language, Contributions to North American Ethnology, 6, preface (1890).

[8] American Indian Languages Still Spoken and Their Genetic Relationships, by C. F. Voegelin, *in* Language, Culture, and Personality, pp. 15–41 Menasha, Wis. (1941).

[9] The term Ohio Valley Siouan was first introduced by C. F. Voegelin in an article, Internal Relationships of the Siouan Languages, AA 43.246–9 (1941); Griffin later objected to such a designation, mainly on archeological grounds. The evidence in this paper proves conclusively that this group has definite linguistic reality, whatever the term which may finally be agreed upon.

Biloxi, Ofo, and Tutelo, all of them now extinct. The geographic distribution of these languages is worth noting. While Ofo on the lower Mississippi and Biloxi around Mobile Bay are virtually neighbors, Tutelo and its dialects were spoken in Virginia. Yet, from the viewpoint of comparative phonology Tutelo and Biloxi are much more closely related, while Ofo shows a considerable number of phonological innovations. In spite of their geographic distribution, however, these three languages clearly represent a distinct group within the Siouan linguistic family, having mostly archaic features as far as their phonology is concerned. The following list of cognates will illustrate the relationship between Biloxi, Ofo, and Tutelo.

Biloxi	*Ofo*	*Tutelo*	
ma	ámą	ama·ni	*earth*
péti	apéti	pe·ti/ pe·č	*fire*
mása	amǫ́fi	mąs/ma·s	*iron*
ąks	ǫfi	mąksi·	*arrow*
pta	palafi		*flat*
ǫti	ụti	mu·nti	*bear*
ina	ila	mi·n	*sun*
nitapi		tapi	*ball*
tohí	itohi	oto·	*blue, green*
te	te	te·	*dead, to die*
duti	tuti	lu·ti	*to eat*
topá	tópa	to·p	*four*
nąpi	nǫpi	nahąpe	*day*
nató *brain*	nátu *brain*	natǫ́we	*hair*
ti	atí	ati·	*house*
tą	itǫ	itą	*large*
tąki	itǫfka	tahąk	*sister*
dáni	tani	la·ni	*three*
dódi	ičóti	loti	*throat*
nǫpá	núpa	nomp	*two*
si	čífi	isi·	*foot*
są	afą́	asą́i	*white*
ąsé·p	ąfépi	nise·p	*axe*
sepí	iftepí	asépi	*black*
ksą	kifą	kisą	*five*
čúki	ačuki	čǫk	*dog*
čti	ačúti	ačụ·ti	*red*
ayą	ičǫ	miyẹi	*wood*
yanti	ičanti	yą·ti	*heart*
ku	ku	nko	*to give*
akuxpé	akapé	akasp	*six*
o	ho	wihoi	*fish*
aho	áho	wahu·i	*bone*
kąxó	etikǫ́so	ekụi	*grandfather*
kte	kte	kite·/kte·	*to kill*
hị	ihí		*hair*

1.5.2. Biloxi consonant phonemes are: stops, p, t, c, d, č, k; fricatives, s, š, x; aspirate, h; nasals and voiced continuants m, n, w, y.[10]

Phoneme /c/ apparently does not occur in Siouan cognates. Historically, /d/ belongs in a category with the voiced continuants.

Biloxi vowel phonemes are: oral, i, e, a, o, u; and nasal, į, ą, ǫ, ụ. Stress is phonemic.

1.5.3. The consonant phonemes of Ofo are: stops, p, t, č, k; fricatives, f, s, š, x; aspirate, h; nasal and voiced continuants, m, n, w, l, y.[11]

Ofo vowels are: i, e, a, o, u, and nasal į, ą, ǫ, ụ. Stress is phonemic.

1.5.4. The consonant phonemes of Tutelo are: p, t, č, k; s, š, x, h; m, n, w, l, y.

Tutelo had a complete series of oral and nasal vowels: oral, i, e, a, o, u; and nasal, į, ẹ, ą, ǫ, ụ. Some of the latter may be the result of borrowing from non-related Southeastern languages. Stress was phonemic in Tutelo; length was probably not, but it is marked throughout on all cognates where our sources indicate length.

1.6.1. Throughout this paper Catawba material will be cited whenever it is patently Siouan; also to be cited is all Catawba lexical material, whenever there is the slightest suspicion that we are dealing with a Siouan cognate. The Catawba material available for this study was scanty, and obvious Siouan cognates were extremely rare in this material.

It is impossible for the writer to tell what place—if any—Catawba occupies in the

[10] Phonemes analyzed from J. O. Dorsey and J. R. Swanton, A Dictionary of the Biloxi and Ofo Languages, BAE-B 47 (1912).

[11] After J. O. Dorsey and J. R. Swanton, A Dictionary of the Biloxi and Ofo Languages, BAE-B 47 (1912); here we have slightly normalized Swanton's transcription. Swanton distinguished between normal voiceless consonants (p, t, k, f, s) and aspirated ones (ph, th, kh, fh, sh, etc.); however, in most cases these seemed to be free variants of the same phoneme. In not one case was there a real contrast.

Siouan linguistic family. It is clear, however, that, in spite of geographic proximity, Catawba and Tutelo do not form a group of Siouan languages, nor does Catawba exhibit any similarity to the Ohio Valley group more than to any other group in Siouan. If comparative morphological research will prove Catawba to be definitely Siouan, then there are two possible alternatives. Catawba may form a group of Siouan, strongly divergent from all other groups and from the parent language. The other possibility is that Catawba may be the remnant of a larger pre-Siouan linguistic stock[12].

For comparative purposes, the phonemes (tentative) of Catawba are listed below.

1.6.2. Catawba consonants are: stops, p, b, t, d, č, k, g, ʔ; fricatives, s, š, h; nasal, m, n; and voiced continuants, w, r, y.

[12] A very comprehensive account of the history of research on Catawba, from its discovery as a Siouan language by Gatschet in 1881 and its rediscovery by Chamberlain in 1886 to more recent times, is given by F. G. Speck, Catawba Texts, CU 24 (1934); the Siouan affinities of Catawba morphology were conclusively demonstrated by F. T. Siebert, Jr. in his Linguistic Classification of Catawba, IJAL 11.100–104 and 211–18 (1945).

Catawba, like Tutelo, has oral and nasal vowel series: oral, i, e, a, o, u; nasal, į, ę, ą, ǫ, ų. Both length and stress seem to be phonemic.

1.7. The following abbreviations of languages will be used in the remaining parts of this study.

Hidatsa—H.
Crow—C.
Mandan—M.
Dakota—D.
Santee—Ds.
Yankton—Dy.
Teton—Dt.
Assiniboin—Da.
Winnebago—W.
Čiwere—Č.
Omaha-Ponca—OmP.
Osage—Os.
Kansa—K.
Quapaw—Q.
Biloxi—Bl.
Ofo—Of.
Tutelo—Tu.
Catawba—Ca.

AN AMERICAN INDIAN MODEL OF THE UNIVERSE[1]

BENJAMIN LEE WHORF†

I find it gratuitous to assume that a Hopi who knows only the Hopi language and the cultural ideas of his own society has the same notions, often supposed to be intuitions, of time and space that we have, and that are generally assumed to be universal. In particular, he has no general notion or intuition of TIME as a smooth flowing continuum in which everything in the universe proceeds at an equal rate, out of a future, through a present, into a past; or, in which, to reverse the picture, the observer is being carried in the stream of duration continuously away from a past and into a future.

After long and careful study and analysis the Hopi language is seen to contain no words, grammatical forms, constructions or expressions that refer directly to what we call TIME, or to past, present, or future, or to enduring or lasting, or to motion as kinematic rather than dynamic (i.e. as a continuous translation in space and time rather than as an exhibition of dynamic effort in a certain process) or that even refer to space in such a way as to exclude that element of extension or existence that we call TIME, and so by implication leave a residue that could be referred to as TIME. Hence, the Hopi language contains no reference to TIME, either explicit or implicit.

At the same time, the Hopi language is capable of accounting for and describing correctly, in a pragmatic or operational sense, all observable phenomena of the universe. Hence, I find it gratuitous to assume that Hopi thinking contains any such notion as the supposed intuitively felt flowing of TIME, or that the intuition of a Hopi gives him this as one of its data. Just as it is possible to have any number of geometries other than the Euclidean which give an equally perfect account of space configurations, so it is possible to have descriptions of the universe, all equally valid, that do not contain our familiar contrasts of time and space. The relativity viewpoint of modern physics is one such view, conceived in mathematical terms, and the Hopi Weltanschauung is another and quite different one, non-mathematical and linguistic.

Thus, the Hopi language and culture conceals a METAPHYSICS, such as our so-called naive view of space and time does, or as the relativity theory does, yet a different metaphysics than either. In order to describe the structure of the universe according to the Hopi, it is necessary to attempt—insofar as it is possible—to make explicit this metaphysics, properly de-

[1] This article was left among the papers of Benjamin L. Whorf when he died in 1944, and was turned over by Mrs. Whorf to George L. Trager with partially completed materials and linguistic notes. In editing the paper here published, E. A. Kennard and G. L. Trager have made no substantial changes from Whorf's draft.

Previous publications of Whorf's relevant to this article are: Gestalt Technique of Stem Composition in Shawnee, Appendix to Part IV of C. F. Voegelin, Shawnee Stems and the Jacob P. Dunn Miami Dictionary, Prehistory Research Series, No. 9, pp. 390–406 (Indiana Historical Society, 1940); The Hopi Language, Toreva Dialect, *in* Linguistic Structures of Native America, pp. 158–183 (Viking Fund Publications in Anthropology, No. 6, 1946); The Punctual and Segmentative Aspects of Verbs in Hopi, Lg. 12.127–31 (1936); Some Verbal Categories of Hopi, Lg. 14.275–286 (1938); Science and Linguistics, Technology Review, Vol. 42, No. 6 (1940); Linguistics as An Exact Science, Technology Review, Vol. 43, No. 2 (1940); Languages and Logic, Technology Review, Vol. 43, No. 6 (1941); The Relation of Habitual Thought and Behavior to Language *in* Language, Culture and Personality, pp. 75–93 (Menasha, Wis., 1941). The four articles immediately preceding have been reprinted by the Foreign Service Institute, Department of State: Four Articles on Metalinguistics (1949).

scribable only in the Hopi language, by means of an approximation expressed in our own language, somewhat inadequately it is true, yet by availing ourselves of such concepts as we have worked up into relative consonance with the system underlying the Hopi view of the universe.

In this Hopi view, time disappears and space is altered, so that it is no longer the homogeneous and instantaneous timeless space of our supposed intuition or of classical Newtonian mechanics. At the same time new concepts and abstractions flow into the picture, taking up the task of describing the universe without reference to such time or space—abstractions for which our language lacks adequate terms. These abstractions, by approximations of which we attempt to reconstruct for ourselves the metaphysics of the Hopi, will undoubtedly appear to us as psychological or even mystical in character. They are ideas which we are accustomed to consider as part and parcel either of so-called animistic or vitalistic beliefs, or of those transcendental unifications of experience and intuitions of things unseen that are felt by the consciousness of the mystic, or which are given out in mystical and (or) so-called occult systems of thought. These abstractions are definitely given either explicitly in words—psychological or metaphysical terms—in the Hopi language, or, even more, are implicit in the very structure and grammar of that language, as well as being observable in Hopi culture and behavior. They are not, so far as I can consciously avoid it, projections of other systems upon the Hopi language and culture made by me in my attempt at an objective analysis. Yet, if MYSTICAL be perchance a term of abuse in the eyes of a modern Western scientist, it must be emphasized that these underlying abstractions and postulates of the Hopian metaphysics are from a detached viewpoint equally (or to the Hopi, more) justified pragmatically and experientially as compared to the flowing time and static space of our own metaphysics, which are *au fond* equally mystical. The Hopi postulates equally account for all phenomena and their interrelations, and lend themselves even better to the integration of Hopi culture in all its phases.

The metaphysics underlying our own language, thinking, and modern culture (I speak not of the recent and quite different relativity metaphysics of modern science) imposes upon the universe two grand COSMIC FORMS, space and time; static, three-dimensional, infinite space, and kinetic, one-dimensional, uniformly and perpetually flowing time; two utterly separate and unconnected aspects of reality (according to this familiar way of thinking). The flowing realm of time is, in turn, the subject of a threefold division; past, present, and future.

The Hopi metaphysics also has its cosmic forms comparable to these in scale and scope. What are they? It imposes upon the universe two grand cosmic forms, which as a first approximation in terminology we may call MANIFESTED and MANIFESTING (or, UNMANIFEST) or again, OBJECTIVE and SUBJECTIVE. The objective or manifested comprises all that is or has been accessible to the senses, the historical physical universe, in fact, with no attempt to distinguish between present and past, but excluding everything that we call future. The subjective or manifesting comprises all that we call future, BUT NOT MERELY THIS; it includes equally and indistinguishably all that we call mental—everything that appears or exists in the mind, or as the Hopi would prefer to say, in the *heart*, not only the heart of man, but the heart of animals, plants, and things, and behind and within all the forms and appearances of nature in the heart of nature, and by an implication and extension which has been felt by more than one anthropologist, yet would hardly ever be spoken of by a Hopi himself, so charged is

the idea with religious and magical awesomeness, in the very heart of the Cosmos, itself.[2] The subjective realm (subjective from our viewpoint, but intensely real and quivering with life, power, and potency to the Hopi) embraces not only our FUTURE, much of which the Hopi regards as more or less predestined in essence if not in exact form, but also all mentality, intellection, and emotion, the essence and typical form of which is the striving of purposeful desire, intelligent in character, toward manifestation—a manifestation which is much resisted and delayed, but in some form or other is inevitable. It is the realm of expectancy, of desire and purpose, of vitalizing life, of efficient causes, of thought thinking itself out from an inner realm (the Hopian *heart*) into manifestation. It is in a dynamic state, yet not a state of motion—it is not advancing towards us out of a future, but ALREADY WITH US in vital and mental form, and its dynamism is at work in the field of eventuating or manifesting, i.e. evolving without motion from the subjective by degrees to a result which is the objective. In translating into English the Hopi will say that these entities in process of causation *will come* or that they—the Hopi—*will come to* them, but in their own language there are no verbs corresponding to our *come* and *go* that mean simple and abstract motion, our purely kinematic concept. The words in this case translated *come* refer to the process of eventuating without calling it motion—they are *eventuates to here* (pew'i) or *eventuates from it* (angqŏ) or *arrived* (pitu, pl. öki) which refers only to the terminal manifestation, the actual arrival at a given point, not to any motion preceding it.

This realm of the subjective or of the process of manifestation, as distinguished from the objective, the result of this universal process, includes also—on its border but still pertaining to its own realm—aspect of existence that we include in our present time. It is that which is beginning to emerge into manifestation; that is, something which is beginning to be done, like going to sleep or starting to write, but is not yet in full operation. This can be and usually is referred to by the same verb form (the EXPECTIVE form in my terminology of Hopi grammar) that refers to our future, or to wishing, wanting, intending, etc. Thus, this nearer edge of the subjective cuts across and includes a part of our present time, viz. the moment of inception, but most of our present belongs in the Hopi scheme to the objective realm and so is indistinguishable from our past. There is also a verb form, the INCEPTIVE which refers to this *edge* of emergent manifestation in the reverse way—as belonging to the objective, as the edge at which objectivity is attained; this is used to indicate beginning or starting, and in most cases there is no difference apparent in the translation from the similar use of the expective. But at certain crucial points significant and fundamental differences appear. The inceptive, referring to the objective and result side and not like the expective to the subjective and causal side, implies the ending of the work of causation in the same breath that it states the beginning of manifestation. If the verb has a suffix which answers somewhat to our passive, but really means that causation impinges upon a subject to effect a certain result—i.e. *the food is being eaten*, then addition of the INCEPTIVE suffix in such a way as to refer to the basic action produces a meaning of causal cessation. The basic action is in the inceptive state, hence whatever causation is behind it is ceasing, the causation explicitly referred to by the causal suffix is hence such as WE would call past time, and the

[2] This idea is sometimes alluded to as the spirit of the Breath (hikwsu) and as the Mighty Something (ʔaʔne himu) although these terms may have lower and less cosmic, though always awesome connotations.

verb includes this and the incepting and the de-causating of the final state (a state of partial or total eatenness) in one statement. The translation is *it stops getting eaten*. Without knowing the underlying Hopian metaphysics it would be impossible to understand how the same suffix may denote starting or stopping.

If we were to approximate our metaphysical terminology more closely to Hopian terms, we should probably speak of the subjective realm as the realm of HOPE or HOPING. Every language contains terms that have come to attain cosmic scope of reference, that crystallize in themselves the basic postulates of an unformulated philosophy, in which is couched the thought of a people, a culture, a civilization, even of an era. Such are our words reality, substance, matter, cause, and as we have seen space, time, past, present, future. Such a term in Hopi is the word most often translated *hope*—tunátya—*it is in the action of hoping, it hopes, it is hoped for, it thinks or is thought of with hope*, etc. Most metaphysical words in Hopi are verbs, not nouns as in European languages. The verb tunátya contains in its idea of hope something of our words thought, desire, and cause which sometimes must be used to translate it. The word is really a term which crystallizes the Hopi philosophy of the universe in respect to its grand dualism of objective and subjective; it is the Hopi term for *subjective*. It refers to the state of the subjective, unmanifest, vital and causal aspect of the cosmos, and the fermenting activity toward fruition and manifestation with which it seethes—an action of *hoping*; i.e. mental-causal activity, which is forever pressing upon and into the manifested realm. As anyone acquainted with Hopi society knows, the Hopi see this burgeoning activity in the growing of plants, the forming of clouds and their condensation in rain, the careful planning-out of the communal activities of agriculture and architecture, and in all human hoping, wishing, striving, and taking thought; and as most especially concentrated in prayer, the constant hopeful praying of the Hopi community, assisted by their exoteric communal ceremonies and their secret, esoteric rituals in the underground kivas—prayer which conducts the pressure of the collective Hopi thought and will out of the subjective into the objective. The inceptive form of tunátya, which is tunátyava, does not mean *begins to hope*, but rather *comes true, being hoped for*. Why it must logically have this meaning will be clear from what has already been said. The inceptive denotes the first appearance of the objective, but the basic meaning of tunátya is subjective activity or force; the inceptive is then the terminus of such activity. It might then be said that tunátya *coming true* is the Hopi term for objective, as contrasted with subjective, the two terms being simply two different inflectional nuances of the same verbal root, as the two cosmic forms are the two aspects of one reality.

As far as space is concerned, the subjective is a mental realm, a realm of no space in the objective sense, but it seems to be symbolically related to the vertical dimension and its poles the zenith and the underground, as well as to the *heart* of things, which corresponds to our word INNER in the metaphorical sense. Corresponding to each point in the objective world is such a vertical and vitally INNER axis which is what we call the wellspring of the future. But to the Hopi there is no temporal future; there is nothing in the subjective state corresponding to the sequences and successions conjoined with distances and changing physical configurations that we find in the objective state. From each subjective axis, which may be thought of as more or less vertical and like the growth-axis of a plant, extends the objective realm in every physical direction, though these directions are typi-

fied more especially by the horizontal plane and its four cardinal points. The objective is the great cosmic form of extension; it takes in all the strictly extensional aspects of existence, and it includes all intervals and distances, all seriations and number. Its *distance* includes what we call time in the sense of the temporal relation between events which have already happened. The Hopi conceive time and motion in the objective realm in a purely operational sense—a matter of the complexity and magnitude of operations connecting events—so that the element of time is not separated from whatever element of space enters into the operations. Two events in the past occurred a long *time* apart (the Hopi language has no word quite equivalent to our TIME) when many periodic physical motions have occurred between them in such a way as to traverse much distance or accumulate magnitude of physical display in other ways. The Hopi metaphysics does not raise the question whether the things in a distant village exist at the same present moment as those in one's own village, for it is frankly pragmatic on this score and says that any *events* in the distant village can be compared to any events in one's own village only by an interval of magnitude that has both time and space forms in it. Events at a distance from the observer can only be known objectively when they are PAST (i.e. posited in the objective) and the more distant, the more PAST (the more worked upon from the subjective side). Hopi, with its preference for verbs, as compared to our own liking for nouns, perpetually turns our propositions about things into propositions about events. What happens at a distant village, if actual (objective) and not a conjecture (subjective) can be known *here* only later. If it does not happen *at this place* it does not happen *at this time*; it happens at *that* place and at *that* time. Both the *here* happening and the *there* happening are in the objective, corresponding in general to our past, but the *there* happening is the more objectively distant, meaning, from our standpoint, that it is further away in the past just as it is further away from us in space than the *here* happening.

As the objective realm displaying its characteristic attribute of extension stretches away from the observer toward that unfathomable remoteness which is both far away in space and long past in time, there comes a point where extension in detail ceases to be knowable and is lost in the vast distance, and where the subjective, creeping behind the scenes as it were, merges into the objective, so that at this inconceivable distance from the observer—from all observers—there is an all-encircling end and beginning of things where it might be said that existence, itself, swallows up the objective and the subjective. The border land of this realm is as much subjective as objective. It is the abysm of antiquity, the time and place told about in the myths, which is known only subjectively or mentally—the Hopi realize and even express in their grammar that the things told in myths or stories do not have the same kind of reality or validity as things of the present day, the things of practical concern. As for the far distances of the sky and stars, what is known and said about them is suppositious, inferential—hence, in a way subjective—reached more through the inner vertical axis and the pole of the zenith than through the objective distances and the objective processes of vision and locomotion. So the dim past of myths is that corresponding distance on earth (rather than in the heavens) which is reached subjectively as myth through the vertical axis of reality via the pole of the nadir—hence it is placed BELOW the present surface of the earth, though this does not mean that the nadir—land of the origin myths is a hole or cavern as we

should understand it. It is Palátkwapi *At the Red Mountains*, a land like our present earth, but to which our earth bears the relation of a distant sky—and similarly the sky of our earth is penetrated by the heroes of tales, who find another earth-like realm above it.

It may now be seen how the Hopi do not need to use terms that refer to space or time as such. Such terms in our language are recast into expressions of extension, operation, and cyclic process provided they refer to the solid objective realm. They are recast into expressions of subjectivity if they refer to the subjective realm—the future, the psychic-mental, the mythical period, and the invisibly distant and conjectural generally. Thus, the Hopi language gets along perfectly without tenses for its verbs.

CENTRAL OTOMIAN II: PRIMITIVE CENTRAL OTOMIAN RECONSTRUCTIONS

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1. Introduction
2. Mazahua
3. Correspondences between Proto-Otomí and Proto-Mazahua
4. Primitive Central Otomian reconstructions

1. Reconstructions based upon a number of Otomí dialects were presented in a previous paper.[1] The present study deals with Mazahua and provides reconstructions of Primitive Central Otomian, which comprises Proto-Otomí and Proto-Mazahua.

2.1. The speakers of Mazahua, numbering over 77,000 according to the 1930 census,[2] inhabit an area just west of the Southwestern Otomí, covering part of the northwestern portion of the State of Mexico and spilling over slightly into the neighboring State of Michoacan.

2.2. The Mazahua evidence used in the reconstructions at the end of this paper was drawn from two sources:

a) A long vocabulary of over 1500 entries, phonemically recorded, from San Miguel Tenoxtitlan, Mexico, transcribed by J. and M. Muro of the Summer Institute of Linguistics.

b) A short vocabulary of about 450 items from Ixtapa de Oro, Mexico, recorded phonetically by Weitlaner.

The pueblo of San Miguel Tenoxtitlan is located in the northwestern corner of the Mazahua area, that of Ixtapa de Oro in the southwestern part. Also consulted, though not included in our comparative evidence, were very brief vocabularies from Palizada, Mexico, near San Miguel Tenoxtitlan, and from Zitácuaro, Michoacan, which is situated on the west-central border of the Mazahua territory; both of these vocabularies were collected by Hazel Spotts, Summer Institute of Linguistics.[3] From these and other scattered sources we conclude, with Soustelle, that the Mazahua region reveals a degree of homogeneity which makes it impracticable, at least without more detailed dialect materials, to attempt any division into dialect groups.[4] As a matter of fact, Mazahua shows less dialect diversity than the neighboring Southwestern sub-region of Otomí.

2.3. The following are the phonemes we have reconstructed for Proto-Mazahua:

p, t, k, ʔ; b, d, g
c[ts], č[tš], s, š, z, ž, h
m, n, ñ; r, w, y
i, į, e, ę, ɛ, a, ą, ɔ, o, ǫ, u, ų, ʌ(unrounded o), ə (unrounded u)

Two Proto-Mazahua phonemes, *ž and *ǫ, do not appear in Proto-Otomí: *ž is a special development in Mazahua, a palatalization of Primitive Central Otomian *d; *ǫ, on the other hand, is an identical reflex of Primitive Central Otomian *ǫ,

[1] Central Otomian I: Proto-Otomí Reconstructions, IJAL 15.1–19 (1949). See **3.0–3.6** of this earlier paper, which will be referred to hereafter as CO I, for a discussion of the procedures used also in the present paper.

[2] William L. Wonderly, Review of Mapas Lingüísticas de la República Mexicana, IJAL 13.124 (1947).

[3] In this paper, as in CO I, we are grateful to the Summer Institute of Linguistics for generously turning over to us the material of its field workers.

[4] Jacques Soustelle, La Famille Otomi-Pame du Mexique Central (Paris, 1937), 291.

which has been pooled with *ų in Proto-Otomí *ų. With these two exceptions, the remaining phonemes in the above list comprise the total set of Proto-Otomí phonemes.

Tone is not indicated in our Mazahua material.[5]

With regard to consonant clusters and syllabic structure, the phoneme combinations of Mazahua appear to be identical with those of Otomí (**4.1** of CO I). Of the Otomí diphthongs, however, only əi occurs in one of the Mazahua dialects. The remaining diphthongs of Otomí show Mazahua correspondences with an intercalated m (**3.4**, below).

2.4. Morphophonological features. A system of multiple stem forms, with change of the initial consonant or consonant cluster, exists in Mazahua as well as in Otomí. But the variety of consonantic alternations observed in Otomí is replaced in Mazahua by a simpler interchange between the initial consonant of the primary stem and a palatalized form of the consonant in the secondary stem.[6] Furthermore, the Mazahua system extends to nouns as well as verbs, whereas in Otomí only the verbs undergo the change of initial consonantism.

[5] While this paper was being written, Eunice Pike was doing field work in the Mazahua region, checking on the results of previous Summer Institute people. She reports a tone system for Mazahua. We hope that this work by members of the Summer Institute of Linguistics in several Otomí locales will make it possible eventually to follow up our study of the segmental phonemes with a reconstruction of the tone or tone-stress system. That the history of Otomian tones may be closely allied to that of other phonemes is more than a mere suspicion: the multiple stem system, which shows up in Central Otomian as one of initial consonant alternation, is a system of tone alternation in the stems of Matlatzinca (Southern Otomian).

[6] For the Otomí system, see **4.2** of CO I. The stem system of Mazahua is discussed in Hazel Spotts, Palatalization in Mazahua, Linguistic Bulletin (Summer Institute of Linguistics) 2.19–20 (1944).

The primary stem of the verb in Mazahua and Otomí is used throughout the present tense paradigm. The secondary (palatalized) stem of the Mazahua verb appears in the second, and sometimes in the third person of non-present tense-aspects, the same type of stem in nouns occurring with the first and second persons of the possessive pronoun; in Otomí the secondary stem of the verb is used in the third person of non-present tense-aspects. In some instances the consonantic interchange between primary and secondary stems in Mazahua (?- and ?y-, h- and hy-) is identical in form with that of Otomí. But in other instances the Mazahua alternation (t- and č-, k- and c-, n- and ñ-) has no counterpart in Otomí. There are several cases in our comparisons of verbs which show a correspondence between the primary form of Mazahua and the secondary form of Otomí (**4**, below).

On the basis of internal evidence it seems fairly clear that Otomí reflects the more archaic Central Otomian form of a varied multiple stem system. The palatalizing alternations in the Mazahua system appear to be an innovation, for here Mazahua reveals the same type of phonological change that it exhibits in its extensive palatalization of Central Otomian consonants (**3.2**, below). Apparently, then, Mazahua has simplified the multiple stem system in form by recasting the consonant alternations in line with the palatalizing changes it has undergone historically.

Internal evidence does not indicate whether this system applied only to verbs or to nouns as well as verbs on the Central Otomian level. But the fact that a multiple stem system operating in both nouns and verbs is found in Matlatzinca (Southern Otomian) and in Chichimeca (Northern Otomian) suggests that this more extensive functioning of the system is a Primitive Otomian feature, retained in Mazahua and restricted to verbs only in Otomí.

In the compounding of free morphemes

Mazahua, like Otomí, drops the second vowel of a first-position stem: Tenoxtitlan thəshəmə *white earth* (thəšə *white*, həmə *earth*), the Otomí equivalent in López Yepes being t?ashəi (t?aši *white*, həi *earth*). But Mazahua does not exhibit the changes of the second-position stem, found in the Otomí loss of the first-syllable vowel with resulting changes in the juxtaposed consonants: Tenoxtitlan ndɛs?ibi *live coals* (s?ibi *fire*) but López Yepes dɛspi (-spi, combining form of cibi *fire*); Tenoxtitlan parehe *hot water* (-rehe < ndehe *water*, showing the regular change of medial -r- < initial nd-) but López Yepes pathe (-the, combining form of dehe *water*).

2.50. Dialect differences within Mazahua. The two Mazahua dialects show differentiated correspondences for Primitive Central Otomian initial *d, initial and palatalized *r, *c, *i after *ę of the preceding syllable, *į, *ę, *ą, *ų, and *ęi; these dialect differences and the Proto-Mazahua reconstructions are indicated in the treatment of the phonological correspondences (**3.2**–**3.4**). On the whole, these differences are superficial. The major phonological divergence lies in the loss of nasalization in the vowels of San Miguel Tenoxtitlan. But even here the change has not run its full course, for a few residue forms occur in Tenoxtitlan which retain the nasalized vowels shown in the Ixtapa de Oro dialect and in Proto-Otomí.

The following paragraphs describe the special phonological reflexes which have developed in one or the other dialect of Mazahua.[7]

[7] Hereafter, particularly in lists of examples, the following abbreviations will be used: Ixtap (the Ixtapa de Oro dialect of Mazahua), Mz (Mazahua), Ot (Otomí), PCO (Primitive Central Otomian), PMz (Proto-Mazahua), POt (Proto-Otomí), Tenox (the San Miguel Tenoxtitlan dialect of Mazahua). Numerals following the examples will refer to the list of reconstructed forms at the end of this paper.

2.51. The vowels of monosyllabic words become V?V in the Tenoxtitlan dialect: PCO *cɛ *cold*, PMz *s?ɛ, Tenox s?ɛ?ɛ; PCO and PMz *khwa *rabbit*, Tenox khwa?a (see also 32, 126).

2.52. Before PMz intervocalic *n a prothetic h appears in Tenoxtitlan: PCO *khəni *maize dough*, PMz *khənə, Tenox khəhnə; PCO *dʌni *flower*, PMz *ndʌnʌ, Tenox ndʌhnʌ (see also 43).

2.53. A PMz *h between identical vowels is lost in the Ixtapa de Oro dialect: PCO and PMz *?ęhę *to come*, Ixtap ?ęę; PCO *t?iʌhiʌ *mountain*, PMz *t?ehe, Ixtap t?ee.

2.54. Before PMz intervocalic *s a prothetic n occurs in the Tenoxtitlan dialect: PCO *dɛsɛ *wild cherry*, PMz *ndɛse, Tenox ndɛnse.

3.1. The phonological system of PCO is more faithfully preserved in Otomí than in Mazahua. The main phonological divergences of Otomí from the parent language are: a) PCO *ǫ and *ų have fallen together into POt *ų; b) PCO *r has been retained only initially but has been fused with POt *n in word medial position.

Mazahua has undergone a wider range of changes. Outstanding among them are the progressive assimilatory changes which have affected both its consonants and vowels (**3.2** and **3.3**, below). The PMz phoneme *ž, a Mazahua innovation, arose as the result of such assimilatory conditions operating on PCO *d. In addition, all of the PCO diphthongs except *əi have developed into PMz *VmV (**3.4**, type a, below).

The following paragraphs will list each of the PCO consonants, vowels, and diphthongs, given as the first starred form in each entry, with its POt and PMz correspondences. Since the dialect reflexes within Otomí have already been described in a previous paper (**4.3**–**4.7** of CO I), only the reconstructed POt phonemes will be

presented here. The great majority of PMz phonemes represent identical reflexes in the two dialects we are using as evidence, and in such cases the starred PMz form will be given without indicating the identical dialect correspondences. The PMz reconstructed sound will be accompanied by the corresponding dialect forms of San Miguel Tenoxtitlan and Ixtapa de Oro only in those reflexes which are differentiated in these two Mazahua dialects.

3.2. Consonants. The term PALATALIZED will refer to the assimilatory change which certain PCO consonants, when occurring after the front vowels *i, *į, *e, *ę, *ɛ, have undergone in PMz. The palatalized reflexes of PCO *t, *d, *n, *r, *k, and *g are, respectively, PMz *č, *ž, *ñ, *ʔy, *c, and *z. The term NORMAL will indicate the non-palatalized reflexes of these PCO consonants in PMz.

*p: POt *p, PMz, *p (101, 131, 132, 137, 169—).[8]

*b: POt *b, PMz *b (1, 2, 3—4, 40).

*mb: POt *mb, PMz *b (103, 104—9, 102).

*m: POt *m, PMz *m (46, 100, 101, 113, 130—).

[8] The numbered references, leading to the reconstructed morphemes and words listed at the end of this paper, do not attempt to provide an exhaustive citation of all the evidence for the correspondences and reconstructed phonemes. A maximum of five references is given, merely as a restricting convention, when that many or more examples support a particular correspondence; when fewer than five are presented, the reader will know that the supporting evidence is limited.

The numerals given before the dash refer to those reconstructions which include the Otomí and Mazahua cognates. In this paper, as in the previous one (see fn. 13 of CO I), we provide only a representative sampling of the cognate evidence upon which the reconstructed forms are based. The numbers after the dash refer to the reconstructions with which the cognate evidence is not presented.

*t: POt *t, a) normal PMz *t (30, 152, 168, 169, 179—); b) palatalized PMz *č (2, 54, 191—62, 128).

*d: POt *d, a) normal initial PMz *nd-: Tenox nd-, Ixtap nr- (44, 45, 47, 48, 49—); b) normal medial PMz *-r- (49, 55—17, 110, 199); c) palatalized PMz *ž (1, 53, 94, 104—4).

*n: POt *n, a) normal PMz *n (43, 55, 85, 125, 154—); b) palatalized PMz *ñ (179—66, 109, 156, 170).

*r: a) initial POt *r- (146, 147—148, 149, 150); b) medial POt *-n- (29, 137—22, 82, 140); c) normal PMz *ʔd: Tenox ʔd, Ixtap d (29, 146, 147—27, 34); d) palatalized PMz *ʔy: Tenox ʔy, Ixtap y (47, 137—139, 149, 150).

*ñ: POt *ñ, PMz *ñ (126, 127, 130—70, 158).

*k: POt *k, a) normal PMz *k (84, 85, 94, 201—160); b) palatalized PMz *c (123—88).

*g: POt *g, a) normal initial PMz *ng- (53, 55—56, 57, 119); b) normal medial PMz *-g- (85—33, 111, 141, 143); c) palatalized PMz *z (24, 54—80, 171, 187).

*ʔ: POt *ʔ, PMz *ʔ (1, 29, 84, 147, 169—).

*h: POt *h, PMz *h (45, 58, 94, 101, 179—).

*c: POt *c, PMz *sʔ: Tenox sʔ, Ixtap s (31, 32, 132—42, 78).

*č: POt *č, PMz *č (43—).

*s: POt *s, PMz *s (48, 151—).

*š: POt *š, PMz *š (59, 152, 153, 154, 162—).

*z: POt *z, PMz *z (113, 194, 200, 201—144).

*w: POt *w, PMz *w (76, 192, 193, 201—17).

*y: POt *y, PMz *y (24, 125, 147, 194, 195—).

3.3. Vowels. In addition to the palatalization of consonants, certain PCO vowels have undergone progressive assimilatory changes in PMz. This has

primarily affected a second-syllable front vowel through the influence of the vowel in the preceding syllable. But with the PCO low mid vowels, *ɛ and *ɔ, the assimilatory change has taken place in PMz second syllables regardless of the first-syllable vowels.

*i: POt *i, a) PMz *i in monosyllables, first syllables, and second syllables after PCO *i or *ɛ (1, 47, 53, 103, 123—); b) PMz *e in second syllables after PCO *e (137—); c) PMz *ę in second syllables after PCO *ę: Tenox e, Ixtap ę (179—61, 62, 170, 178); d) PMz *a in second syllables after PCO *ą (59—); e) PMz *ʌ in second syllables after PCO *ʌ (29—16, 52, 167); f) PMz *ə in second syllables after PCO *a, *ɔ, *o, *ǫ, *ų, or *ə (43, 85, 101, 154, 169—).[9]

*į: POt *į, PMz *į: Tenox i, Ixtap į (104—188).

*e: POt *e, a) PMz *e in monosyllables, first syllables, and second syllables after any vowel except PCO *ʌ (45, 55, 94—128, 156); b) PMz *ʌ in second syllables after PCO *ʌ (30—15, 73, 143, 199).

*ę: POt *ę, PMz *ę: Tenox ɛ, Ixtap ę (179—5, 60, 158, 170).

*ɛ: POt *ɛ, a) PMz *ɛ in monosyllables and first syllables (2, 46, 47, 192, 194—); b) PMz *e in second syllables (48—).

*a: POt *a, PMz *a (84, 85, 125, 194, 201—).

*ą: POt *ą, PMz *ą: Tenox a, Ixtap ą (44, 58, 59, 126—177).

*ɔ: POt *ɔ, a) PMz *ɔ in monosyllables and first syllables (115—13, 111, 142, 190); b) PMz *o in second syllables (53, 55—110, 156).

*o: POt *o, PMz *o (32, 54, 55, 147—157).

*ǫ: POt *ų, PMz *ǫ (130—12, 56, 161, 189).

*u: POt *u, PMz *u (125—42).

*ų: POt *ų, PMz *ų: Tenox u, Ixtap ų (113—70, 96, 166, 185).

*ə: POt *ə, PMz *ə (31, 43, 154—22, 144).

*ʌ: POt *ʌ, PMz *ʌ (29, 30—16, 51, 167).

3.4. Diphthongs. Two types of diphthongs are set up in PCO. One of these is a type consisting of vowel plus *i. There can be little doubt that these *Vi diphthongs, which occur in nearly all of the present-day Otomí dialects, were a genuine feature of PCO structure. With the exception of PCO *əi, these diphthongs have developed into PMz *Vmi, the *i then assimilating to the preceding vowel in accordance with the changes applying to any second-syllable *i (**3.3,** above). Since most of these diphthongs have a nasal vowel as the first element in PCO and POt, the PMz *m in such cases is obviously a reflex of the vowel nasalization. Included among diphthongs of this type are the PCO vowel complexes separated by *h, which show a symmetrical PMz reflex of *Vhmi, the final *i again assimilating to the vowel of the previous syllable.

A second type of diphthong, with a high vowel (*i, *į, *ə) as the first element and a vowel other than *i as the second, is assigned to PCO purely as a formula to take care of a series of distinct Otomí-Mazahua correspondences. Those cases in which the POt low vowels and high back vowels *a, *ą, *ų, *ə correspond to PMz *i are reconstructed with the PCO formulas *ia, *ią, *ių, *iə: thus, PCO *ñią *head*: POt *ñą, PMz *ñi is distinct from PCO *ñą *to speak*: POt *ñą, PMz *ñą. Those in which the POt high-mid back vowels *o and *ʌ correspond to PMz *e are reconstructed with the PCO formulas *io and

[9] We have no examples of Mazahua reflexes of PCO *i after *į or *u, the latter vowels appearing rarely in our data. On the basis of the assimilations of PCO *i after the twelve other vowels in Mazahua, however, PCO *i after *į would presumably be PMz *i and after *u would give PMz *ə.

*iʌ: PCO *?yio *reed*: POt *?yo, PMz *?ye contrasts with PCO *?yo *dog*: POt *?yo, PMz *?yo. In addition, PCO *əą is established to cover the cases in which POt *ą corresponds to PMz *ə. In view of the progressive assimilatory influences that have operated upon Mazahua, it is likely that this type of diphthong formula represents an assimilatory factor, giving a high or front vowel reflex in PMz, rather than a genuine diphthong in the parent language. But, because the conditioning factor cannot be determined from the data—it may involve tone or stress phenomena, which are not marked in our material—we must symbolize these special Otomí-Mazahua correspondences as distinctive vowel combinations at the PCO level.

a) PCO diphthongs:—*ęi: POt *ęi, PMz *ęme: Tenox ɛme, Ixtap emę (127, 151—118); *əi: POt *əi, PMz *əmə (191—71); *ǫi: POt *ųi, PMz *omə (162—); *ųi: POt *ųi, PMz *umə (72—); *əi: POt *əi, PMz *əi (3—); *ąhi: POt *ąhi, PMz *ahma (114—); *ąhį: POt *ąhį, PMz *ahma (76—); *əąhį: POt *ąhį, PMz *əhmə (180—).

b) PCO diphthongal formulas:—*ia: POt *a, PMz *i (24—4, 17, 155, 187); *ią: POt *ą, PMz *i (130—107, 109, 119, 165); *io: POt *o, PMz *e (2, 195—25, 196); *ių: POt *ų, PMz *i (46—10, 69); *iə: POt *ə, PMz *i (24, 54—41, 64, 98); *iʌ: POt *ʌ, PMz *e (94—120, 174); *įa: POt *ą, PMz *imi (123—); *əą: POt *ą, PMz *ə (49—172, 181).

4. The entries in the list of reconstructions below are arranged in the following alphabetical sequence: ?, a, ą, b, c, č, d, e, ę, ɛ, ə, g, h, i, į, k, m, n, ñ, o, ǫ, ɔ, p, r, s, š, t, u, ų, ʌ, w, y, z, ž. Three types of problematical reconstructions are included in the list.

A palatalized consonant sometimes appears initially in Mazahua (**3.2,** above), with no preceding front vowel as a conditioning factor. In such cases the PCO reconstruction will include a pre-initial *(i) to symbolize the palatalizing factor operating on the initial consonant in Mazahua (88, 149, 150, 184, 191).

For several verbs the Mazahua cognate is a primary stem corresponding to the secondary stem in Otomí (**2.4,** above). Most of our examples belong to the verb type which alternates initial ?- and ?y- or h- and hy- (30, 49, 80, 82, 198).

The number words from *six* through *nine* are composed of a first-position morpheme, similar in form to those from *one* through *four*, plus *-to in POt but *-nto (or palatalized *-nčo after front vowels) in PMz. There being no phonological explanation for the difference in form in the second-position element of the two languages, both are assigned as concomitant forms to the PCO level (54, 68, 196).

Other conventions adopted in presenting the reconstructed forms—the method employed to give a sampling of the cognate evidence, the reconstruction of *? before a voiced consonant or an initial vowel, the indications of tone and vowel quantity in the cognates, the inclusion of initial *n- before *d or *g—are the same as those used in a previous paper.[10]

1. *?bɛdi *to lose:* Ot Lop bɛdi, Tem ?bědí; Mz Tenox bɛži.

2. *?bɛtio *grandchild:* POt *?bɛto (2); Mz Tenox bɛče.

3. *?bəi *to be:* Ot Lop bəi, Tem ?bě̱i̱; Mz Ixtap bəi.

4. *?bidia *music.* 5. *?ęhę *to come.* 6. *?ə *to hurt.* 7. *?i *chile.* 8. *?iši *sour.* 9. *?mbaši *broom.* 10. *?ñių *road.* 11. *?otho *nothing.* 12. *?ǫ *salt.* 13. *?ə *flea.* 14. *?rok?a *potato.* 15. *?ʌde *to hear.* 16. *?ʌni *hen.* 17. *?wadia *maguey.* 18. *?ya *to rot.* 19.

[10] For abbreviations of the Otomí dialects, see fn. 14 of CO I; other abbreviations used in the list of reconstructions are given in fn. 7 of this paper. Numbers in parentheses following a POt starred form refer to the reconstructions listed at the end of CO I.

*ʔyaši *carpenter*. 20. *ʔyɛ *hand, arm*. 21. *ʔyə *root*. 22. *ʔyəri *to be fragrant*. 23. *ʔyiə *metate rolling pin*.

24. *ʔyiəgia *neck:* POt *ʔyəga (29), Mz Tenoz ʔyizi.

25. *ʔyio *reed*. 26. *ʔyo *dog*. 27. *ʔyori *dry*. 28. *ʔyotʔi *to dry*.

29. *ʔyʌri *to empty:* Ot Lop yʌni; Mz Tenox ʔyʌʔdʌ.

30. *ʔyʌtʔe *to do:* Ot Lop yʌtʔe, secondary stem of POt *ʔʌtʔe (22); Mz Tenox ʔyʌtʔʌ.

31. *cʔə *tail:* POt *cʔə (40); Mz Ixtap sʔə·.

32. *cʔo *bad, dirty:* POt *cʔo (43); Mz Tenox na sʔoʔo bɛzo *the bad man*, sʔorehe *bad water* (-rehe, medial form of ndehe; see *dehe *water*, 45).

33. *cʔogi *to spit*. 34. *cʔori *to injure*. 35. *ca *to bite* (POt, 45); *to swallow, to devour* (PMz). 36. *cɛ *cold*. 37. *cədi *to obtain*. 38. *cəti *to suck*. 39. *ci *to eat, to drink*. 40. *cibi *fire*. 41. *ciə *to suck*.

42. *cu *female:* POt *cu, *cų (55); Mz Tenox sʔuminʔyo *fox* (*minʔyo *coyote*, 108), sʔuʔyoʔo *female dog* (*ʔyo *dog*, 26), Ixtap suʔyo· *female dog*.

43. *čəni *eagle:* POt *čəni (60); Mz Tenox čəhnə (see *šəni *eagle*, 154, the form attested from the Mz dialect of Ixtap).

44. *dą *big:* POt *dą (63); Mz Tenox ndatita *great-grandfather* (tita *grandfather*), ndañiʔyɛʔɛ *thumb* (ñiʔyɛʔɛ *finger*).

45. *dehe *water:* POt *dehe (64); Mz Tenox ndehe, Ixtap nree.

46. *dɛmių *bottle gourd:* Ot Lop dɛmų; Mz Tenox ndɛmi.

47. *dɛri *firefly:* Ot Lop dɛni; Mz Tenox ndɛʔyi.

48. *dɛsɛ *wild cherry:* POt *dɛsɛ (71); Mz Tenox ndɛnse.

49. *dəądi *to answer:* Ot Lop dądi, secondary stem of POt *thądi (295); Mz Tenox ndərə.

50. *do *stone*. 51. *dʌ *old, big*. 52. *dʌni *flower*.

53. *gidə *tear:* POt *gi- *water of* (85) and *də *eye* (79); Mz Tenox ngižo.

54. *(i)giə-to, -nto *nine:* POt *gəto (84); Mz Tenox nzinčo.

55. *go-, privative: Ot Lop goda *blind* (POt *də *eye*, 79), gone *dumb* (PCO *ne *mouth*, 116); Mz Tenox ngoro *blind*, ngone *dumb*.

56. *gǫ *ear*. 57. *gwa *foot*.

58. *hą *yes:* POt *hą (94); Mz Ixtap hą.

59. *hąši *to roast:* Ot Tem hą̈šɨ; Mz Tenox haša.

60. *hę *deep*. 61. *hęcʔi *sky*. 62. *hętʔi *to spin thread*. 63. *haši *to whistle*. 64. *-hiə, suffix used with first person pronoun to indicate plural inclusive, with second person pronoun to indicate plural. 65. *hmų *boss*. 66. *hnini *town*. 67. *hñą *speech, language, word*. 68. *hñią-to, -nto *eight*. 69. *hñių *three*. 70. *hñǫni *food*. 71. *hɔi *earth*.

72. *hųi *to lay eggs:* Ot Lop hųi; Mz Tenox humə.

73. *hʌcʔe *to cook*. 74. *hwa *wing*. 75. *hwahni *to select*.

76. *hwąhį *maize land:* POt *hwąhį (119); Mz Tenox hwahma.

77. *hwiphi *to blow*. 78. *hyaci *to dawn*. 79. *hyadi *sun*. 80. *hyɛgi *to leave* (secondary stem in Ot Lop; primary stem in Mz Tenox). 81. *hyə *heavy*. 82. *hyori *to search* (secondary stem in Ot Lop; primary stem in Mz Tenox). 83. *hyoya *orphan*.

84. *kʔa *horsefly:* POt *kʔa (124); Mz Tenox kʔaʔa.

85. *kʔangi *blue, green:* POt *kʔangi (125); Mz Ixtap kʔangə.

86. *kʔaštʔi *yellow*. 87. *kʔę *to complain*. 88. *(i)kʔə *to remove*. 89. *kəni *to grind* (POt, 132); *stone for grinding maize* (Mz Tenox). 90. *kha *to be, to exist*. 91. *khə *bean*. 92. *khəni *maize dough*. 93. *khi *blood*.

94. *khiʌde *skirt, petticoat:* POt *khʌde (150); Mz Ixtap khɛže.

95. *kho *nobody*. 96. *khų *man's sister*. 97. *khwa *rabbit*. 98. *kiətʔi *to enter*. 99. *ko *man's brother-in-law*.

100. *ma *to go:* POt *ma (160); Mz Tenox maʔa, Ixtap ma.

101. *maphi *to shout:* POt *maphi (166); Mz Tenox maphə.

102. *mba *milk.*

103. *mbɛphi *to work:* POt *mbɛphi (173); Mz Tenox bɛphi.

104. *mbịdị *fright:* Ot Lop mbịdị; Mz Tenox mbiži.

105. *meše *spider.* 106, *mɛti *money.* 107. *miądi *expensive.* 108, *min?yo *coyote.* 109. *minią *squirrel.* 110. *modə *mosquito.* 111. *məgi *crooked.* 112. *mų *gourd.*

113. *mụza *sapodilla:* Ot Lop mụza; Mz Tenox muza.

114. *n-dąhi *wind, air:* POt *n-dąhi (190); Mz Tenox ndahma.

115. *n-də *seed:* POt *n-də (194); Mz Tenox ndə.

116. *ne *mouth.* 117. *ne *to want, to like.* 118. *nẹi *to dance.* 119. *ngiąhią *left.* 120. *n-giʌ *meat.* 121. *n-gǫ *rat, mouse.* 122. *n-gų *house.*

123. *nikhịa *church:* POt *nikhą (206); Mz Tenox nichimi.

124. *noho *fat.*

125. *nuya *now:* POt *nuya (217); Mz Ixtap nuya.

126. *ña *to speak:* POt *ña (219); Mz Tenox ña?a, Ixtap ñątho *Mazahua language* (*-tho *nothing but*, 183).

127. *ñẹi *doctor, conjurer:* POt *ñẹi (221); Mz Ixtap ñemẹ.

128. *ñẹte *conjurer* (POt, 222); *medicine, poison* (Mz Tenox). 129. *ñią *head.*

130. *ñiąhmǫ *knee:* POt *ñąhmų (220); Mz Ixtap ñihmǫ.

131. *pa *hot:* POt *pa (226); Mz Tenox pa?a, Ixtap pa.

132. *pac?i *to raise:* Ot Lop pac?i; Mz Ixtap pas?ə.

133. *padia *buzzard.* 134. *pahni *shirt.* 135. *paši *to sweep.* 136. *pe *to weave.*

137. *peri *to wash clothes:* POt *peni (234); Mz Ixtap peye.

138. *pɛc?i *to have.* 139. *pɛri *a fruit* (Mexican Spanish *tejocote*). 140. *phari *horse,* and *large animal* in compounds (see combinations with *ši *leaf*, 156, and *za *tree, stick*, 200). 141. *phəgi *foam.* 142. *phədi *to take care of.* 143. *phʌge *to bark.* 144. *pozə *rattlesnake.* 145. *pɔ *to sell.*

146. *ra, article singular: Ot Lop ra; Mz Tenox ?da.

147. *ra?yo *new:* POt *ra?yo (242); Mz Tenox ?da?yo.

148. *rac?i *to cross over.* 149. *(i)rɛt?a *ten.* 150. *(i)rote *twenty.*

151. *sẹi *pulque:* POt *sẹi (247); Mz Ixtap semẹ.

152. *šat?i *to scrape:* Ot Lop šat?i; Mz Tenox šat?ə.

153. *šɛdi *dust-storm:* POt *šɛdi (254); Mz Tenox šɛži.

154. *šəni *eagle:* POt *šəni (257); Mz Ixtap šənə (see *čəni *eagle*, 43, the form attested from the Mz dialect of Tenox).

155. *šəthia *back.* 156. *ši *leaf*, and *covering* in compounds, as in POt (259) and in Mz Tenox šižo *eyelash* (POt *də *eye*, 79), šipha?də *hide, skin* (PCO *phari *horse*, 140), Ixtap šiñe *lip* (PCO *ne *mouth*, 116), šiphadə *hide, skin.* 157. *ši?yo *wool.* 158. *šihñę *lungs.* 159. *šiphi *to tell.* 160. *šoki *to open.* 161. *šǫdi *morning, shade.*

162. *šǫi *night:* POt *šụi (275); Mz Ixtap šomə.

163. *šə *fingernail.* 164. *šədi *to pray, to read.* 165. *štią *hair.* 166. *-šụ- *female person*, found only in composition, as in POt *šụci *girl* (273), *t?išų *daughter* (286), and in Mz Tenox ndišu, Ixtap nrišų *woman.* 167. *šʌni *pitcher.*

168. *t-, nominalizing or third verb stem prefix (see **4.2** of CO I) with verbs whose primary stem begins in h or ?: Ot Lop thẹt?i *spinning stick* (PCO *hẹt?i *to spin thread*, 62), thəši *whistling sound* (PCO *həši *to whistle*, 63), hehe *to cough* giving POt *thehe *a cold* (302), t?opho *writing* (POt *?opho *to write*, 13); Mz Tenox thehe *a cough*, Ixtap thęč?ę *spinning stick.*

169. *t?aphi *unfermented juice of maguey*, POt *t?aphi (279); Mz Ixtap t?aphə.

170. *t?ẹni *toys.* 171. *t?ɛgi *metal, bell.* 172. *t?əąši *grasshopper.* 173. *t?iə *child.* 174. *t?iʌhiʌ *hill, mountain.* 175. *t?o

louse. 176. *ta *father*. 177. *thą *ear of corn*. 178. *thędi *tamale*.

179. *thęni *to cart:* Ot Lop thęni; Mz Tenox thẽñe.

180. *thəąhį *thread, rope:* POt *thąhį (296); Mz Tenox thəhmə.

181. *thəąt?i *to tie*. 182. *thi *outside*. 183. *-tho *nothing but*. 184. *(i)thədi *to touch*. 185. *thųhni *bench*. 186. *tiədi *torch pine*. 187. *tigia *duck*. 188. *tį *drunk*. 189. *tǫhǫ *to sing*. 190. *tɔgi *to fall down*.

191. *(i)tɔi *to buy, market:* POt *tɔi (317); Mz Tenox Ixtap čɔmə.

192. *wɛ *frog:* POt *wɛ (320); Mz Tenox wɛ?ɛ.

193. *-wi, associative 1st and 2nd persons: POt *-wi (321); Mz Tenox nuzgowi 1st pers. plu. excl. (nuzgo 1st pers. sing.), Ixtap čɛwi *to meet* (perhaps related to POt *nthɛ *to meet*, 211).

194. *yɛza *twig:* Ot Lop yɛza; Mz Tenox yɛza.

195. *yiohio *two:* POt *yoho (326); Mz Tenox yehe.

196. *yio-to, -nto *seven*. 197. *yo *candle*. 198. *yodi *to give birth* (secondary stem in Ot Lop; primary stem in Mz Tenox). 199. *yʌde *to obey*.

200. *za *tree, stick*, and *plant* in compounds: POt *za (328), *zaphani *forage, hay* (235); Mz Tenox za?a, Ixtap za·, and compounded in Tenox zapha?də *forage, hay* (PCO *phari *horse*, 140).

201. *zakhwa *pig:* POt *zakhwa (329); Mz Tenox zakhwa.

202. *zɛdi *strong*. 203. *zɛngwa *to greet*.

A UNIQUE TONE PERTURBATION IN MIXTECO

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1. General tone characteristics
2. The unique perturbation
3. Verbs not affected by the unique perturbation
  3.1. Verbs which condition following tones
  3.2. Post-main verbs
4. Text

1. This paper sets forth a phenomenon of Mixteco tone which runs counter to the trend of other tonal perturbing action, which is with few exceptions always from a mid or low tone to a high tone. First we review briefly Mixteco tonal phenomena described at length by K. L. Pike,[1] and then proceed to the description of a unique exception to these phenomena.

Mixteco morphemes, except for a few monosyllabic ones which have not been found in isolation, are all dissyllabic in their full form; though when uttered in phrases, especially in fast speech, many of them become monosyllabic:[2] na pre-main verb auxiliary *again, repeat* (no dissyllabic form yet found), as in nasama *repeat change*, i.e. *to change, alter*; žu *mouth of, beside*, before modifiers (<žuʔu *mouth*) as in žu ⁿdúča *beside the water*.

There are many close-knit phrases of two or more morphemes, in which all morphemes retain their full form, or in which the first morpheme may optionally lose its second syllable, or in which the first morpheme is always abbreviated, in many cases its meaning being lost or obscure. Examples are: šinî béʔe *roof* (< šinî *head* + beʔe *house*); kʷàʔa núu ~ kʷànúu *lend* (< kʷàʔa *give* + núu *short time*); hukʷiñi *stand, stop* (<hu-unknown meaning + kʷiñî *stand upright*).

The basis of all tonemic analysis in Mixteco is the dissyllabic morpheme, with two units of level tone (referred to as tone couplets). Abbreviated (monosyllabic) morphemes, with few exceptions, act like full morphemes: (1) they condition the perturbation of a following morpheme in the same way as their full (dissyllabic) form does; (2) tone changes effected upon the monosyllabic morpheme in the presence of a preceding conditioning morpheme are the same as they would be for that syllable in the dissyllabic form of the morpheme.

[1] See Kenneth L. Pike, Analysis of a Mixteco Text, IJAL 10:113–38 (1944), for a description of Mixteco morpheme structure; and Kenneth L. Pike, Tone Languages, University of Michigan Publications, Linguistics IV, (Ann Arbor, 1949), pp. 77–94, for a fuller discussion of Mixteco tone. Pike has not handled the unique tone perturbation discussed in the present paper.

This paper is based on the dialect of San Miguel el Grande, Oaxaca, Mexico, as is also Pike's material. The data were gathered during a field trip by the author in 1947–48.

The author wishes to express her appreciation to Kenneth Pike and William Wonderly for their suggestions and help in the presentation of this paper.

[2] Mixteco phonemes are as follows: Voiceless unaspirated stops /p, t, č, k, kʷ, ʔ/; prenasalized voiced stops /ᵐb, ⁿd, ⁿj, ᵑg/; fricatives /b, d, ž, h/ (/b/ slightly voiced except after glottal stop or between /ə/ vowels, when it becomes [w]; /ž/ = [y] after /l/ or /š/, [ž] ∞ [y] elsewhere; /h/ varying freely with frictionless velar); sibilants /s, š/ (/š/ with some speakers considerably backed); nasals /m, n, ñ/; liquids /l, r/ (/r/ being a flap in the only two enclitics in which it occurs); oral vowels /i, e, a, o, u, ə/ (/i, a, o, u/ approximately as in Spanish mil, mal, posole, mula; /e/ as in Spanish pelota, with allophone as in English *get* in morphemes with medial glottal stop, medial prenasalized voiced stop, or medial /t/ or /r/; /ə/ high, back, unrounded, often approaching more fronted position); nasalized vowels /į, ą, ǫ, ų, ə̨/; high tone /ˊ/, low tone /ˋ/, mid tone (unmarked).

All morphemes in Mixteco fall into two classes, those which condition the perturbation of the following morpheme and those which do not. High-high morphemes (unless they themselves are derived from another tone class) always condition the perturbation of perturbable morphemes following them.[3] Basic (unperturbed) tone couplets high-low, mid-high, and low-mid, never condition the tones of another morpheme. Within the remaining tone couplets, (high-mid, mid-mid, mid-low and low-high), certain morphemes do, and certain do not, condition the tones of the immediately following morpheme. Those which do so are an entirely arbitrary group.

We now review briefly the perturbation of tone couplets when they follow such conditioning morphemes. Tone couplets high-high, high-mid, high-low and mid-high are never perturbed following these morphemes. The remaining tone couplets are perturbed as follows (the first morpheme in the illustrations being the conditioning morpheme and the second the perturbed morpheme):

Mid-mid > high-mid: kəbə́ bíko *fiesta day* (< kəbə̀ *day* + biko *fiesta*).

Mid-low: Patterns CVV with identical vowels, CV?V, and CV?CV > high-low: hi̱i̱ žóò[4] *with the moon* (< hi̱i̱ *with* + žoò *moon*). Patterns CVV with diverse vowels, and CVCV > mid-high: šinì ?itá *head of the flower* (< šinì *head* + ?ità *flower*).

Low-high > high-high: kʷa?à súčí *many children* (< kʷa?à *many* + sùčí *children*).

Low-mid > high-mid: ⁿdežu bá?a *good food* (< ⁿdežu *food* + bà?a *good*).

[3] The only exceptions are róó *you* familiar (full [object] form), and žóó *we* inclusive (full [object] form), neither of which have perturbing influence though they are high-high morphemes. The short enclitic forms -ró and -žó, however, do affect the tones of following morphemes.

[4] Long vowels (contiguous identical vowels) and contiguous diverse vowels, are regarded phonemically as consisting of two syllables. See Pike's note on this in Tone Languages, footnote p. 79.

2. From the above summary it will be seen that tones are regularly perturbed only to high. However, there is one exception to these rules[5] which we will now attempt to set forth.

Many common verb phrases are those with the verbs *go* and *come* as auxiliaries, plus another verb. Two of these auxiliaries, both of which mean *go*, are under consideration in this paper; they are hereinafter called '*go* auxiliaries' and are now listed in their various aspects (these verbs are also used as main verbs):

kị?ị̀ *will go to a specified location* (kị́?ị̀ *is going to a specified location*);

kʷą?ą̀ *will go with destination or time of return not specified* (kʷą?ą̀ *to have gone away and not yet returned*; há?ą̀ *is going*, habitual, i.e. *goes often, every day*; nì hą?ą̀ *went away and has returned*; kʷą́?ą́ *go*! imperative).

These verbs as well as the ones meaning *come* usually (but not always) lose their second syllable (and also the nasal quality of the vowel) when used as auxiliaries in a close-knit construction with another verb. Cf. kʷàⁿdúkú *went to search for* (< kʷą?ą̀ + ⁿdúkú); kiką?ą̀ *will go and speak* (< kị?ị̀ + ką?ą̀).

When the *go* verbs are used as auxiliaries, mid-mid verbs following them are perturbed to low-mid. This is a unique perturbation in that (1) the first tone of the mid-mid morphemes becomes low, whereas all regular perturbations are to high tone, and in that

[5] Beside the exception discussed in this paper, one word, be?e *house*, has its first tone changed to low following inì *in, inside:* inì bè?e *in the house*. See Tone Languages, pp. 81–2, for Pike's discussion of this phrase. Also, some morphemes with high-high tone couplets, when following a mid-low morpheme, are changed to low-high: ità kʷą̀ą́ *yellow flower* (< ità *flower* + kʷą́ą́ *yellow*). See Tone Languages, p. 86, on this.

In the neighboring town of San Esteban Atatláhuca perturbation of tone from higher to lower (as well as from lower to higher) is very extensive. The tone perturbation discussed in this paper is no doubt either a remnant of this more extensive phenomenon, or it has been developed more fully in San Esteban.

(2) these *go* auxiliaries never condition perturbation otherwise. All mid-mid verbs are so affected by the *go* auxiliaries, except (1) mid-mid verbs which themselves condition the tones of a following morpheme (cf. **3.1.** below), and (2) a small group of mid-mid verbs which may be classed as post-main verbs (cf. **3.2.** below).

One might postulate tone fusion between the last syllable of the *go* auxiliary and the first syllable of the main verb, if it were not for the fact that when the *go* auxiliary retains its full form (in slow speech) the tone of the main verb is still lowered. Cf. kikùči ~ kį̀ʔį́ kúči *will go and bathe* (< kį̀ʔį́ + kuči). Other examples are: kʷákòto-ró-tə́ *Go and watch the animals!* (< kʷáʔá *go!* + koto *watch, guard* + -rò *you, familiar* + -tə̀ *animals*); kikòʔo-ná ⁿduča *I am going to drink some water* (< kį̀ʔį́ *will go* + koʔo *drink* + -ná *I* + ⁿduča *water*).

Note also the sequence pre-main verb + main verb + post-main verb modifier: nì hačùʔíčí-ná-de *I went to put him on the road*, i.e. *I went a short way with him* (< nì *completed action* + hąʔą́ *went* + čuʔu *put* + iči *road* [> íčí as post-main verb modifier] + -ná *I* + -de *he*). In this close-knit construction, the mid-mid main verb čuʔu has lost its second syllable, but the first syllable still takes the low tone following the *go* auxiliary. kičìbàʔa-rì ⁿdatíñu *I am going to put the things away* (< kį̀ʔį́ *will go* + čiʔi *pass something through or into* + bàʔa *good* [> čibàʔa *put away, save*] + -rì *I, familiar* + ⁿdaʔa *hand* + tiñu *work* [> ⁿdatíñu *things*]).

The verb kii *come* is also abbreviated to ki- (homophonous with ki- < kį̀ʔį́) when it precedes another verb in a close-knit construction, and thus, when the main verb has tones other than mid-mid, there are many homophonous verb phrases, distinguished only by context. Cf. kikąʔą̀ *go and speak* (< kį̀ʔį́ + kąʔą̀) : kikąʔą̀ *come and speak* (< kii + kąʔą̀). However, for mid-mid main verbs this homophony does not exist, because of the action of the above described rule, which applies to ki- < kį̀ʔį́ but not to ki- < kii. Cf. kikį̀ʔį́ *go and get* (< kį̀ʔį́ + *kį̀ʔį́*) : kikį̀ʔį́ *come and get* (< kii + kį̀ʔį́); kiⁿǰàka *take away* (lit. *go carry*; < kį̀ʔį́ + ⁿǰaka) : kiⁿǰaka *bring* (lit. *come carry*; < kii + ⁿǰaka).

When the morpheme na *repeat, again* (dissyllabic form not known) comes between the *go* auxiliary and the main verb, it is lowered in tone exactly like a mid-mid main verb: nì hanàsáⁿdóó *went to make straight* (< nì *completed action* + hąʔą̀ *went* + na *repeat* + sáʔa *make, do* + ⁿdóó *straight* [> sáⁿdóó *make straight*]). Moreover, na itself conditions following mid-mid verbs (except those described under **3.1.** and **3.2.**) exactly as do *go* auxiliaries, but only when following these auxiliaries: kinàtǫ̀ǫ *go and braid* (< kį̀ʔį́ + na + tǫǫ); kinàkàča *go and wash* (<kį̀ʔį́ + na + kača); kinàkį̀ʔį́ *go and get again* (< kį̀ʔį́ + na + kį̀ʔį́).

3. There are two restrictions to the above described tonal action as it affects mid-mid verbs:

3.1. Mid-mid morphemes which always condition the tones of a following morpheme according to regular tone rules described above (**1**), do not have their tones changed following *go* auxiliaries. This also is an irregular phenomenon; in any other context all perturbable morphemes with this conditioning influence are themselves perturbed following conditioning morphemes. An unperturbed abbreviated *go* auxiliary always takes a low tone before these verbs, if it is in the completive or potential aspect (but t takes a high tone in the durative aspect, as do all other verbsǰ. Cf. kìkaʔni-dé šⁿdəkə̀ *he will go and kill the ox* (< kį̀ʔį́ *will go* + kaʔni *kill* + -de *he* + šⁿdəkə̀ *ox*). Note that -de *he* > -dé following kaʔni *kill*, and kaʔni is itself unaffected by preceding ki- (< kį̀ʔį́). Verbs which condition the tones of following morphemes and which remain mid-mid following *go* auxiliaries are: kee *eat*; kaʔni *kill*; kaja *shake out*; kažu *cough*; kǫǫ *grind*; koko *strike a match*; koso *mount an animal*; kuʔu

rub; saka *sow*; suku *wrap*; tąą *reserve, keep*; taba *take out, extract*; tutu *whistle*; tuu *roll*; šətə *cut, saw*.

3.2. There are a few other mid-mid verbs which might be expected to take the low-mid tone combination following *go* auxiliaries, but which remain unperturbed. However, these verbs are actually to be regarded as post-main verb modifiers, and the *go* verbs as main verbs in a close-knit construction. One example will clarify the distinction. The verb kožo *pour out* (*as water, grain, etc.*), when in the position of a main verb following a *go* auxiliary, becomes low-mid in accordance with above described rules. However, this verb is much more commonly used as a post-main verb modifier to indicate plurality, with the meaning *pouring forth*, i.e. *in a group*. In such a construction its tones remain mid-mid, even though it follows a *go* verb, which is now not an auxiliary but a main verb. As main verbs the *go* morphemes do not condition the tones of the following morpheme.

kožo > ⁿgožo, in post-main verb position only, following the *go* verbs and other verbs with nasalized vowels. However, following *come* verbs and other verbs with unnasalized vowels, kožo remains unchanged. Therefore we have the following: kikòžo *will go and pour out* (< kį?į *will go* pre-main verb + kožo *pour out* main verb); kiⁿgožo *will go in a group* (< kį?į *will go* main verb + kožo > ⁿgožo *in a group* post-main verb modifier); kikožo *come in a group* (< kii *come* main verb + kožo *in a group* post-main verb modifier).

Note the contrast: nì hakòžo-de nuni *he went to pour out the corn* (< nì *completed action* + hą?ą *went* pre-main verb + kožo *pour out* main verb + -de *he* + nuni *corn*); ni hàⁿgožo-de nù žá?u *they went to market*, i.e. *several men went in a group to market* (< ni *completed action* + hą?ą *went* main verb + kožo > ⁿgožo *in a group* post-main verb modifier + -de *he* + nuù *to* + žà?u *market*).

The mid-mid verbs, in addition to kožo in post-main verb position, (> ⁿgožo after verbs with nasalized vowels), which do not change their tones following *go* auxiliaries, and which are regarded therefore as post-main verb modifiers in these constructions, are as follows: kaa *ascend*; kaⁿda *jump, leap*; keⁿda *emerge, appear*; nuu *descend*; ⁿdaⁿda *jump*; ⁿdeⁿda *re-emerge, reappear*; ⁿdoⁿda *rise up against*. It may be added also that the combinations in this group were elicited from the informant, but probably represent a slightly awkward or unnatural construction with these particular combinations of *go* plus a verb denoting further motion.

Note also that the verbs kaka *walk*, kunu *run*, and ⁿdaba *jump over something*, which conceivably should be in this list because they also denote further motion, were, however, given to me by the informant with the lowered tone.

4. The following is a conversation (artificial but checked with an informant) illustrating some of the constructions described in this paper:

Pedro and his wife meet Juana on the road:

Pedro: ⁿdé či kį?į-ní.

Juana, addressing the two: nù žá?u kį?į-ná, kikʷąą-ná ⁿdatíñu kiⁿjàka-ná nù náà-ná. te máá-ní, ⁿdé či kíⁿgožo-ní.

Pedro: kìⁿgožo-ná raⁿjú, kinàči?i-ná itù. kuní-ní čiⁿdéé tą?ą-ní híí-ná žučąà, kikį?į-ní ⁿduča te ču?u-ní nù itú.

Juana: kuu núsáá, ná kíⁿjàka-ná ku?ù-ná te jaà-ná žučąà.

The next day Juana arrives at Pedro's field with her sister:

Pedro: á kikožo-ní.

Juana: kikožo-ná, kiču?u-ná ⁿduča híí-ña.

Pedro: kuu núsáá, ná kíkee-ná staà te žúan-na te sátiñu-žó.

Translation and comments:

Pedro: *Where are you going?*

Juana: *I'm going to market to buy some things to take to my mother.* (kikʷąą < kį?į *go*

pre-main verb modifier + kʷąą *buy* main verb; kiⁿjàka kį?į *go* pre-main verb modifier + ⁿjaka *carry* main verb.) *And you, where are you going?* (kíⁿgožo < kį?į *go* main verb + ⁿgožo *in a group* post-main verb modifier. kí- has been perturbed to high here by preceding či *direction toward*.

Pedro: *We're going to the farm to plant the cornfield.* (kinàči?i < kį?į *go* pre-main verb modifier + na *repeat* pre-main verb modifier + či?i *plant* main verb. Both na and the first syllable of či?i carry low tones; see **2.**) *Do you want to help us tomorrow by going to get water and pouring it on the field,* (i.e. *in each hole as the corn is planted)?* (kikį?į < kį?į *go* pre-main verb modifier + kį?į *get* main verb.)

Juana: *All right then, I'll bring my sister with me and I'll come tomorrow.*

Next day:

Pedro: *So you've come!* (kikožo < kii *come* main verb + kožo *in a group* post-main verb modifier.)

Juana: *We've come*; *I've come to pour water with her* (*her sister*). (kiču?u < kii *come* pre-main verb modifier + ču?u *put* main verb. Note that ki- < kii does not affect the tone of the main verb.)

Pedro: *All right then, well I'm going to eat first and then we'll work.* (kíkee < kį?į *go* pre-main verb modifier + kee *eat* main verb. Since kee is a verb which perturbs the tones of the following morpheme [see **3.1**], it is not affected by the *go* auxiliary. The morpheme na *deliberation* is a perturbing morpheme and so has caused kì- [before main verbs listed in **3.1**] to become kí-).

PATTERNS OF VOWEL LOSS IN MACUSHI (CARIB)

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1. Underlying pattern
2. Disturbing factors
   2.1. Phonological factors
   2.2. Junctural factors
   2.3. Morphological factors
3. Optional loss

Macushi, a member of the Carib language family, is spoken from the Rupununi River in British Guiana to the Cotingo and Surumu Rivers in Brazil.[1]

1. Underlying pattern. Many morphemes in Macushi occur in alternate forms, the alternation depending upon the occurrence of certain vowels in some alternants which are absent in others. For example, the utterance wnamrí *mirror* contains one morpheme in isolation. When the same morpheme occurs in an utterance with the prefix and suffix indicating first person, singular, alienable possession, it becomes wanmarrî *my mirror*. Thus the morpheme translated *mirror* occurs in two alternate forms: wnamri and wanmar.

If we write this morpheme with all the linear phonemes which occur in it in either utterance we have the basic form (symbolized by the root-sign) of the morpheme: √wanamari. Comparing this basic form of the morpheme with the phonemic form of the utterance which contains the morpheme in isolation, wnamrí, we observe that the odd-numbered vowels in the basic form, counting from left to right, are absent in the phonemic form.

In the same way, if we write each morpheme of the second utterance, wanmarrî *my mirror*, with all the linear phonemes which may occur in it in any environment, we have the basic form of the three morphemes: √u-wanamari-rï.[2] Again we observe that the odd-numbered vowels are lost in the phonemic form of this utterance.

This pattern of loss of all odd-numbered vowels found in the basic form of any utterance is the underlying factor that conditions the choice of which alternant of a morpheme will occur in that utterance. All of the vowel phonemes, i e a o u ï, are affected equally by the pattern.[3]

[1] Field work was carried on from 1944 to 1947 as linguistic investigator for the University of Oklahoma and also as a member of the Unevangelized Fields Mission.

In December, 1948, I took seven hours of Macushi material with Portuguese translation on wire recordings with Jose Barboza, a resident of the Surumu valley, as informant. This paper describes only the material on the mechanical recordings.

This informant's style is characterized by loss of vowel frequently in contour-initial syllables where my field notes show a stressless vowel present in material from other informants. Also, some informants gave a longer open transition, tending to a stressless neutral vowel /ə/, in positions where this informant gives only very short open transition.

I am much indebted to Ben Elson and other faculty members of the Summer Institute of Linguistics for valuable suggestions in the preparation of this paper.

[2] In all the illustrations following this one we shall speak of the basic form of utterances. The basic form of an utterance includes all the morphemes of that utterance, each written with all the linear phonemes which may occur in it in any environment, plus any suprasegmental features (see stress contours in paragraph **2.2** and paragraph **3**) which occur in that particular utterance.

Morpheme border in all basic forms is indicated by a hyphen (-) except where it coincides with word border which is indicated by a space.

[3] Occasionally two vowels occur in sequence in the basic form. In such cases the two vowels count only as one in the underlying pattern of loss of odd-numbered vowels or vowel sequences. When such a vowel sequence occurs in an even-

The underlying pattern of vowel loss may be disturbed, however, by three kinds of factors: (1) phonological, (2) junctural, (3) morphological. The pattern of loss operates from the beginning to the end of each word[4] in the basic form of any utterance, or until a disturbing factor is encountered within the word. Following the point of disturbance, the pattern of loss begins over again so that the first following vowel is number one in the sequence of vowels remaining in the word. Illustrations of this will be introduced as the different disturbing factors are described.

2. Disturbing factors.

2.1. Phonological factors. The occurrence of consonant clusters in the basic form disturbs the underlying pattern of loss of odd-numbered vowels as follows:

(1) The vowel preceding any consonant cluster in the basic form of an utterance is retained in the phonemic form irrespective of whether it is an odd- or even-numbered vowel in that basic form. This statement applies to the vowel preceding any consonant cluster within a stress contour (see paragraph **2.2**) irrespective of word borders.

For example, in the utterance, ši?mrikpé *little now* < √ši?-miri-kī-pé, the first i precedes the cluster ?m and is therefore retained in the phonemic form. After this disturbance the pattern of loss begins over again. Thus the first and third vowels following the point of disturbance in the basic form are lost in the phonemic form. The second and fourth vowels following the point of disturbance are retained.

In the utterance, yeeku? tsa? yá *if anyone deceives me* < √u-y-en-ku?-tī-sa?-yá, the first vowel of the basic form is lost because it is an odd-numbered vowel. The second, third, and fifth vowels of the basic form are retained because they precede consonant clusters. The fourth vowel in the basic form follows a point of disturbance. It therefore becomes the first vowel in the sequence of remaining vowels and is lost in the phonemic form. The last vowel in the basic form is retained because it is the last vowel in a stress contour (see paragraph **2.2**).

(2) There is one type of consonant cluster in the basic form which causes both the vowel preceding it and the vowel following it to be retained irrespective of the underlying pattern. In order to describe this type of cluster, consonants are divided into two groups. Group I consists of p t k s š r. Group II consists of ? m n w y.[5] A vowel in

numbered syllable or in a position where for other reasons a vowel is retained, only the second of the two vowels is actualized in the phonemic form—except when the second vowel is i, in which case the first vowel is retained and the i becomes y: terkú? *his* (reflexive) *ulcer* < √tī-erkú? (see paragraph **2.1** for disturbances in underlying pattern); ra?mayyá *he is looking* < √ e-r-a?-ma-i-yá; ke?wíy *don't kill yourself* < √kī-e?wí-i (ī regularly becomes i before y).

[4] A word is the smallest stretch of speech which may constitute a stress contour (see paragraph **2.2**).

[5] Only consonants of Group II occur postsyllabic within the syllable.

Consonants of Group I always occur with open transition before a following consonant except that sibilant occurs with close transition before stop.

Consonants of Group II occur with open or close transition before a following consonant in the phonemic form as follows: (1) If the two consonants occur in sequence in the basic form there will be close transition between them in the phonemic form. (2) If in the basic form the two consonants are separated by a vowel which is lost in the phonemic form, open transition will occur between them.

Apparent contrast exists between close and open transition. As an illustration of this, note that the type of transition between n and t is different in each of the two illustrations following: ye?mtantí? (close transition between ? and m; open transition between m and t: close transition between n and t) *you* (pl) *go pay it* < √y-e?ma-tan-tí?; ykinto?tón (open transition between y and k, and between n and t; close transition between ? and t) *something to comb him with* < √y-akina-to?-tón.

Open transition has been treated in this paper

the basic form is retained if it precedes or follows any cluster of three consonants or a cluster of two consonants in which the first consonant is a member of Group I: kawkší *tiger* < √kawkší; pakraymĩn? *bush hogs* < √pakra-yamĩn?; kratpé *alligator now* . . √kratu-pé.

2.2. Junctural factors. Utterances contain one or more stress contours. A stress contour is a stretch of speech marked by loud stress on the last vowel. It may include one or more words at the option of the speaker. The end point of contours is marked in phonemic transcription with an acute accent /′/. The beginning point of contours is not marked since it always occurs immediately following pause or following the end point of a preceding contour.

The last vowel in each stress contour in the basic form of any utterance is always retained: pripí *spindle* < √piripí; kawyú *my tobacco* < √u-kaway-ú; manrirĩ *my cassava grater* < √u-manari-rĩ; ši?mrikĩ *little* < √ši?-miri-kĩ; kraywpé *Brazilian now* < √karaywa-pé; ptakaypé *traira-fish now* < √ptakay-pé; uwrĩ e?má *I am the path* (i.e. *I will guide you*) < √uwrĩ e?má.

When more than one word occurs in a stress contour, the last vowel in each nonfinal word in the contour is retained (except as noted in the paragraph immediately following): mĩrĩ ppĩn *not you* < √a-mĩ-rĩ pe-pĩn; yey ayrompkĩ nrĩ *tie up the wood too* < √yey ayromp-kĩ na-rĩ.

When a vowel occurs final in a word but medial in a stress contour within the basic form of an utterance, it will be lost in the phonemic form: (1) if it precedes a word-initial vowel, or (2) if it is both preceded and followed by a syllable containing a vowel which is retained in the phonemic form: a?t enkneka?pĩ[6] *the hammock that he made* < √a?ta en-kone-ka-?pĩ, taye?p paynó *would have said* < √tAye-?pĩ e-paynó (see paragraph **2.3** for retention of the first vowel in this basic form); i?n yo?kó *under the shade* < √i?nĩ yo?kó, ynap to? remĩ?pĩ *they arrived at the edge* < √yena-pĩ to? e-remĩ-?pĩ.

2.3. Morphological factors. A few morphemes contain one vowel in the basic form which always occurs in the phonemic form irrespective of other factors. Retention of such a vowel is phonologically nonpredictable. This fact is indicated by writing the vowel with a capital letter in the basic form: pak pi?pĩ *cowhide* < √pAka pi?pĩ; a?kosá *needle* < √a?kOsá; ka?nepé *quickly* < √ka?nE-pé; ana protrĩ *our* (exclusive) *gunshot* < √Ana piroto-rĩ; an pu?páy *our* (exclusive) *heads* < √Ana pu?páy.

3. Optional loss. A contour-initial vowel in the basic form of an utterance may occur in the phonemic form of that utterance at the option of the speaker, even though no disturbing factor is present. However, if it so occurs it is always stressless, in marked contrast to the other vowels that occur in the phonemic form of the contour.

Thus in a stress contour three types of vowels may occur: (1) The last vowel in the contour (marked with /′/) always occurs with loud stress. (2) The remaining vowels in the contour (unmarked) occur with more or less even stress, unless (3) a contour-initial vowel of the basic form occurs in the phonemic form when no

as nonsyllabic and nonvocalic (1) because the space between the two consonants has no clear vowel quality; (2) because no contrastive vowel qualities are there present; (3) because the transition does not take as much time as the vowels do; and (4) because no vowel phoneme with which this can be phonetically or structurally identified occurs elsewhere in the language.

The contrast between open and close transition, however, remains as an unexplained contrastive residue in the phonemic analysis. The reader can in each illustration cited identify the place of occurrence of either transition type by following the rule given at the first of this footnote.

[6] When a consonant of Group I occurs word-final in the phonemic form, it always syllabifies with the following word.

disturbing factor is present. Such a vowel occurs stressless and is marked with a grave accent /ˋ/[7] in phonemic transcription: àrawtá *baboon* < √àrawtá; rawtá *baboon* < √arawtá; àyanuwyá *I'll eat you* < √à-y-anu-w-yá; èraʔmpìʔ wáyʔ *I looked* < √è-r-aʔ-ma-pìʔ wáyʔ; ìwiyya pîn *it won't kill him* < √ì-wì-i-ya pîn; ùyiʔnpìʔpî *frightened me* < √ù-yiʔ-nìpì-ʔpî; mropáy èsempoʔpî *then he came to the surface* < √moro-páy è-s-em-po-ʔpî.

[7] This symbol does not indicate secondary stress but rather the absence of stress.

When a glottal stop precedes an oral stop in the basic form, the glottal stop may optionally be lost in the phonemic form. However, this loss does not prevent the operation of the disturbing effect of the basic cluster in the basic form: ratïʔpî ~ ratïpî *turned over* < √e-ra-tï-ʔpî; mokapiyyá *he took out* < √moʔ-ka-ʔpï-i-yá; akospé *needle now* < √aʔkOsa-pé; pak pip raʔmtá *go get a cowhide* < √pAka piʔpï e-r-aʔ-ma-tá; ìmïtotón *something to tie it with* < √ì-mï-toʔ-tón.

MORPHOLOGICAL ANALYSIS OF A TZOTZIL (MAYAN) TEXT

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1. Introduction
2. Major form classes
3. Text
4. Free translation
5. Morphological analysis

1. This text was taken by the author in 1946 from María Pérez, a middle aged, bilingual woman. She resides in Nabenchaúc, Chiapas, Mexico, where the Zinacanteco dialect, which differs slightly from other dialects of Tzotzil, is spoken.

Tzotzil has 26 phonemes, including 21 consonants: b, p, t, k, c, č, ʔ, p', t', c', č', m, n, s, š, h, v, y, l, r; and 5 vowels: i, e, a, o, u. The transcription of this text follows that of my previous article[1] with the exception of a few changes regarding initial glottal stop. At the present state of investigation it appears that some particles, and the vowel prefixes i- and a-, which occur word-initial, do not have initial glottal stops. (See words 5, 8, 71, 235 of text.) I have also noticed that initially in words the phoneme b frequently but optionally varies from the nonimplosive allophone to an implosive one with very light lenis suction; this brings the Tzotzil phonetically more in line with various of the other Mayan dialects which regularly have the implosive, as was mentioned.[2]

The morphological analysis has been prepared from data collected in the field under the auspices of the Summer Institute of Linguistics. Parts of the analysis are found to parallel quite closely that of Tzeltal;[3] for example, the list of personal prefixes is identical in both languages. Words 1–80 and 270–292 are analyzed; also certain other words found in the text which show features or combinations of features not exemplified in 1–80 or 270–292.

The text is a combination of two stories relating the informant's experiences with two different witch-doctors. It is interesting to note that the final cure was accomplished because the second witch-doctor prescribed that what the patient had been needing all the time was "hot". Among the Tzotzil all foods and medicines are classified as being either "hot" or "cold", and diets and medicine are given depending upon the conclusion as to which of the two is the necessary treatment.

2. Major form classes.

There are four major form classes of words in Tzotzil: verbs, nouns, attributives and particles.

2.1. Verbs are divided into two main classes:[4] transitive and intransitive, which are differentiated in their inflection. The personal subject prefixes of transitive verbs are the same as the possessive prefixes of nouns. There are two alternants of each personal prefix, the first listed occurring with consonant-initial stems, and the second occurring with vowel-initial stems: h- ∼ k- 1st person, a- ∼ av- 2nd person, s- ∼ y- 3rd person. The subject indicators in intransitive verbs are different from these.

2.2. Nouns are differentiated from verbs and attributives by the pluralizing suffix

[1] Tsotsil Phonemes with Special Reference to Allophones of B, IJAL 13.108–111 (1947).

[2] IJAL 13.108, footnote 2.

[3] Marianna Slocum, Tzeltal (Mayan) Noun and Verb Morphology, IJAL 14.77–86 (1948).

[4] A third class, stative verbs, of Slocum's article is essentially what I am treating as a noun or attributive in a predication.

-etik which occurs with nonpossessed nouns. Compare possessed nouns which take the same possessive prefixes as the personal prefixes of transitive verbs, as stated above. Possessed nouns also take the same pluralizing suffixes (-tik with 1st person, -ik with 2nd and 3rd person) as transitive verbs.

2.3. Attributives are differentiated from verbs and nouns by the pluralizing suffix -ik. Attributives differ from verbs pluralized with -ik in that they do not have a personal prefix. They also differ from nouns pluralized with -ik in that they may not be possessed.

2.4. Particles are divisible into certain sub-groups on the basis of their syntactic distribution; certain particles also take the suffix -uk, indicator of condition contrary to fact.

Certain forms in the language which are now classified under one or the other of the above four major classes either make up additional sub-classes or will need to be described as additional major classes (e.g. numeratives, pronouns).

3. Text Experiences with two witch-doctors.

[1]ba?yi [2]ilik [3]ta [4]kok [5]i [6]činetike. [7]ha? [8]imuy [9]tal [10]ta [11]hsat [12]?un. [13]sitemik [14]ša [15]li [16]hsate. [17]yu?un [18]ša [19]?oš [20]mas [21]ša [22]sitemik [23]hsat [24]k'alal [25]libate. [26]ba [27]htatikotik [28]h?ilol [29]ta [30]paste?. [31]k'ot [32]hak'betikotik [33]mi [34]?o [35]k'usi [36]spošil. [37]?oy [38]ši. [39]istak [40]ta [41]manel [42]ta [43]hobel. [44]coh. [45]lisnibbe [46]yo? [47]bu [48]činetike. [49]ha? [50]?onoš [51]yeč [52]?un. [53]mu [54]?onoš [55]bu [56]čkol. [57]čč'i [58]tal [59]yan. [60]?ošib [61]nan [62]šemana [63]li?ay. [64]ha? [65]noš [66]yeč [67]lisut [68]tal. [69]mahbil [70]tušnuk' [71]isk'an [72]h?eč'el. [73]yu?un [74]ha? [75]čič' [76]lok'el [77]i [78]čamele. [79]čislambe [80]i [81]tušnuk'e. [82]ba?yi [83]iyak' [84]i [85]poše, [86]pero [87]muk [88]bu [89]isbalin. [90]č'abal [91]isbalin [92]?un. [93]ha? [94]?onoš [95]yeč [96]?ip [97]ikom [98]?un. [99]c'akal [100]to [101]isk'an [102]ša [103]i [104]tušnuk' [105]?une. [106]ha? [107]?onoš [108]yeč [109]ikom [110]noštok. [111]ilah [112]i [113]tušnuk'e. [114]h?eč'el [115]no?oš, [116]ča?eč'el [117]islam [118]ta [119]hba. [120]islok'es [121]ta [122]?ora [123]a?a. [124]tey [125]nan [126]istohbe [127]yahval [128]cnavu. [129]mu [130]hna? [131]k'usi [132]iyak' [133]?o. [134]sk'u? [135]nan. [136]kič'oh [137]?eč'el [138]hc'uh [139]kabtel. [140]bik'it [141]to [142]?oš [143]hmuk [144]marian [145]lisči?in. [146]ba?yi [147]ital [148]hmuk [149]marian. [150]ha? [151]?o [152]ik'ot [153]stot [154]sme? [155]tinetik [156]yo? [157]h?ilole [158]k'alal [159]htuk [160]ša [161]?oše. [162]yu?un [163]ba [164]yak' [165]poštalahuk [166]sba. [167]i?albatik [168]ba [169]smanik [170]poš [171]ta [172]hobel. [173]ba [174]smanik [175]tal [176]poš [177]sči?uk [178]yahnil [179]ta [180]hobel [181]?un. [182]ha? [183]ihči?in [184]?eč'el [185]ta [186]sme? [187]stot [188]tah [189]tinetik [190]a?a. [191]?ik [192]ilok'ik [193]eč'el. [194]ha? [195]hči?uk [196]lok'el [197]?un. [198]yu?un [199]ša [200]lihatav [201]?eč'el [202]?un. [203]k'u [204]ti [205]ha? [206]?onoš [207]yečon. [208]muk [209]bu [210]likol. [211]k'alal [212]to [213]hobel [214]ihči?in [215]a?a. [216]te [217]ša [218]ihsa? [219]muč'u [220]ihči?in [221]tal [222]li? [223]ta [224]hnae. [225]mi [226]latal, [227]ši [228]tah [229]hmuk [230]maruč [231]?une, [232]tah [233]mariane. [234]buč'u [235]ači?in [236]tal, [237]ši. [238]tey [239]ik'otik [240]htotik [241]akustin [242]sči?uk [243]yahnil, [244]škut. [245]ibatik [246]ta [247]hobel. [248]ba [249]smanik [250]tal [251]spoš. [252]ha? [253]te [254]ihči?in [255]?eč'el [256]ta [257]hobel [258]?un, [259]škut. [260]?ali [261]te [262]ša [263]ihsa? [264]tal [265]hči?il [266]ta [267]hobel [268]?une, [269]škut. [270]k'u [271]ma [272]ši. [273]batan [274]mi [275]ši, [276]ši. [277]muk [278]bu [279]ihk'opon [280]tal, [281]yu?un [282]lihatav, [283]škut. [284]k'u [285]htu?un, [286]muk [287]bu [288]likol [289]čpoštavan [290]i [291]h?ilol [292]?une.

[293]ihsa? ša yan h?ilol ?un. [294]ha? h?ilol stot ?uma?. [295]mi mu lakol če?e, ši, yo? bu asa? h?ilole, ši. [296]mu?yuk. ha? no?oš yeč lisut tal, škut. [297]yu?un k'išin čak'an, ši. [298]k'u š?elan ta hk'an ?un, škut. [299]?albo tah mariane mi ck'an ccob ton sči?uk c'i ?lel čamak ?o, ši. [300]te čkalbe, škut ?un. [301]iscob i tone. [302]iscobik i c'i?lel ?une. [303]tal yak' ?un k'alalik'išnah ton ?une. [304]tey ta hna tal yak'. [305]hok'bil yunen č'enal te lacal tonetik sči?uk c'i?lel. [306]k'išin ša ?oš i tone, k'alal i?oč ta č'ene. [307]puč'ulon ta sba č'en. [308]pasbil kunen tem ta si?. [309]ličik'inah ?o. [310]ta yok'ob to liyak'be kuč' poš. [311]ha? to ?onoš te ikol ?o ?un. [312]ta čabhe ?o, ta ?oshe ?o, ta čonhe ?o, yaktik ša itakih. [313]ip'al stakinal. [314](ip'al sbi k'alal člok' stakinal ?un.) [315]mu?yuk ša šak' ya?lel. [316]ha? to ikuč'

tah poše ikol ?o ša ?un. [317]ihva?an to ?oš kek'en. [318]va?alon lihuč'un yu?un mu stak' šikehi. [319]ha? pim ta hmek čin ta kok. [320]ta nomtik ič'i ta hšokon a?a. [321]ha? pim ta huhot ko?tak. [322]mu stak' šipuč'i.

4. Free translation.

[1-6] First the pimples broke out on my feet and legs. [7-12] Then they came on up to my face, [13-16] and my eyes were swollen. [17-25]My face was even more swollen when I went. [26-30]We went to find a witch-doctor in Paste?. [31-36]When we got there we asked him if he had any medicine for it. [37-38]"There is," he said. [39→3]He sent for it to be bought in Ciudad Las Casas. [44]It was red. [45-48] He rubbed it on me where the pimples were. [49-52]But it was just the same. [53-56]It didn't get well. [57-59]It kept spreading. [60-63]I was there for about three weeks. [64-68]It was just the same when I returned.

[69-72] Then he asked for beaten out cotton the next time. [73-78]It was to draw out the disease. [79-81]He spread the cotton on me. [82-89]First he put the medicine on but it didn't help. [90-92]It didn't help. [93-98]It kept on being sick. [99-105]It was afterwards that he asked for the cotton. [106-110]But it was still just the same. [111-113]Then the cotton was all gone. [114-119]He just put it on me a time or two. [120-123]Then he took it right off. [124-128]He probably paid for someone to spin it for him. [129-133]I don't know what he did with it, what he made it into. [134-135]Probably a shirt for himself.

[136-139]I took a little bit of work along with me. [140-145]My younger brother Mariano who went with me was still small. [146-149]First my younger brother Mariano came home. [150-161]Then the father and mother of the Augustine family came to the place where the witch-doctor was when I was alone again. [162-166]They went to be treated. [167-172]They were told to go and buy medicine in Ciudad Las Casas. [173-181]They went to buy the medicine in Ciudad Las Casas, he with his wife. [182-190]I went along with the father and mother of that Augustine family. [191-193]It was dark when they left. [194-197]I left with them, [198-202]because I was running away, [203-207]because I was just the same. [208-210]I didn't get well. [211-215]I went as far as Ciudad Las Casas with them. [216-224]There I looked for someone I could accompany here to my house.

[225-233]"Did you come?" said my younger sister Maruca, and Mariano. [234-237]"Who did you come with?" they said. [238-244]"Our father Augustine and his wife came there," I said to them. [245-247]"They went to Ciudad Las Casas. [248-251]They went to buy medicine. [252-259]I went along with them to Ciudad Las Casas," I said to them. [260-269]"There in Ciudad Las Casas I looked for someone to come back with," I said to them [270-272]"What did he say? [273-276]Did he say for you to leave?" they said. [277-283]"I didn't talk to him before I left because I was running away," I said to them. [284-292]What good did it do me? I didn't get well when the witch-doctor treated me.

[293]Then I looked for another witch-doctor. [294]The father of the deaf and dumb woman was a witch-doctor. [295]"Didn't you get well then at the place where you looked for a witch-doctor?" he said. [296]"No, I was just the same when I came back," I said to him. [297]"It is because you need 'hot'," he said. [298]"How do I need it?" I said to him. [299]"Ask Mariano if he would want to gather rocks and weeds to cover you with," he said. [300]"I'll tell him," I said to him.

[301]They gathered the rocks. [302]They gathered the weeds. [303]He came to give it (the cure) when the rocks were hot. [304]He came to give it (the cure) at my house. [305]A little hole was dug for the rocks to be piled up in with the weeds. [306]The rocks were already hot when they went in the hole. [307]I was lying on top of the hole. [308]My little bed was made of firewood. [309]It made me perspire.

[310]The next day he gave me medicine to drink. [311]Not until then did it get well. [312]Daily it dried up more. [313]The scabs flaked off. [314](Flaking off is what it is called when the scabs come off.) [315]The sores didn't run

any more. [316]It wasn't until I drank the medicine that they got well. [317]Before that I had my grinding table up high. [318]I stood up to grind because I was not able to kneel. [319]The sores were thick all over my legs. [320]They were farther apart on my body, [321]but thick on my thighs. [322]I couldn't lie down.

5. Morphological analysis.

1 ba?yi *first* (in time) in context of completed action; cf. ba?yuk *first* (in time) in context of incompleted action.

2 ilik *it started*, intransitive verb:
i- prefix indicating completed action when occurring with 3rd person of intransitive verbs and with 1st and 3rd person of transitive verbs. A zero prefix indicates the 3rd person subject.
-lik *to arise*, intransitive verb stem, here with specialized meaning *to begin to do*.

3 ta atonic particle translated by many of the prepositions of English; here means *on*.

4 kok *my legs*, possessed noun:
k- 1st person possessive prefix alternant occurring with vowel-initial noun stems.[5]
-ok *foot, legs*, noun stem.

5 i particle, alternant of li (roughly parallel to the definite article of Indo-European languages); an enclitic -e must occur at the end of any phrase that begins with a particle li, ti, la, li?, le?, tah, yo?, k'alal, ati, or ali.

6 činetike *pimples*, noun + enclitic:
čin *pimple, skin eruption*, noun stem
-etik pluralizing suffix occurring with unpossessed nouns.
-e enclitic which must occur at the end of a phrase that begins with li (See 5.)

7 ha? particle marking a predication; it may precede verbs (as here), nouns, or attributives. (Verbs, nouns, attributives, and certain particles without ha? may also constitute predications.)

8 imuy *it arose*, intransitive verb:
i- same as in 2.
-muy *to ascend*, intransitive verb stem.

9 tal abbreviated form of talel coming; talel is composed of two morphemes: tal- to come, intransitive verb stem; -el a nominalizing suffix indicating process of the act of verbs. (Cf. 41.) This is the only one of these -el nominalized words that has been found to abbreviate.

10 ta same as 3 but here meaning *to*.

11 hsat *my face*, possessed noun:
h- 1st person possessive prefix alternant occurring with consonant-initial noun stems.
-sat *eye, face*, noun stem.

12 ?un particle which occurs very frequently in narrations at the end of phrases or sentences and seems to indicate emphasis.

13 sitemik *they are swollen*, attributive predication:
sit- *to swell up*, intransitive verb stem.
-em attributivizing suffix which occurs with intransitive verb stems.
-ik pluralizing suffix with attributives which occur with plural nouns.

14 ša *already*, particle; loan from Spanish ya.

15 li same as 5, occurring here in its longer alternant.

16 hsate *my eyes*, noun + enclitic:
h- same as in 11.
-sat same as in 11.
-e same as in 6.

17 yu?un *because*, connecting particle com-

[5] Initial glottal stop is always lost from noun and transitive verb stems when prefixation occurs, placing these nouns and verbs in a class which will be referred to as vowel-initial noun stems and vowel-initial transitive verb stems, and the stems will appear in this paper without the initial glottal stop. The same stems when occurring in a nominalized or intransitivized form or as a passive verb stem retain the initial glottal stop.

bining the thought of the preceding sentence with that of the sentence that it introduces.

18 ša same as 14.

19 ʔoš particle indicating completion of something in the past before another action in the past took place; here it indicates that her eyes were already swollen before the action of going took place.

20 mas *more*, particle; loan from Spanish más.

21 ša same as 14.

22 sitem *it was swollen*, attributive predication; singular form of 13.

23 hsat same as 11.

24 k'alal *when*, particle which is always accompanied by enclitic -e at the end of the phrase. (See 5.)

25 libate *I went*, intransitive verb + enclitic:

l- prefix indicating completed action of intransitive verbs when occurring with 1st or 2nd person subject prefix, and of transitive verbs when occurring with 1st or 2nd person object prefix.

-i- 2nd person subject prefix; it is a subject prefix when occurring with intransitive verbs and an object prefix when occurring with transitive verbs; cf. 45.

-bat *to go*, intransitive verb stem.

-e enclitic occurring with k'alal (or certain other particles; see 5) at the beginning of the phrase.

26 ba *went to do*, alternant form of intransitive verb stem -bat *to go;* here used as an auxiliary verb. A zero prefix indicates completed action in the main verb.

27 htatikotik *we* (exclusive) *found him*, transitive verb: h- 1st person subject prefix alternant occurring with consonant-initial transitive verb stems; cf. 11.

-ta *to find it, arrive at it, catch up with it*, transitive verb stem.

-tik pluralizing suffix occurring with 1st person in transitive verbs.

-otik suffix indicating exclusive; it occurs with both transitive and intransitive verb stems.

28 hʔilol *seer, witch-doctor*, derived noun:

h- personal nominal prefix with agentive forms.

-ʔilol[6] *process of seeing* (in witchcraft), noun composed of two morphemes: -il[7] *to see it*, transitive verb stem; -ol nominalizing suffix. (Cf. -ʔilolah[8] *to see, perform witchcraft*, intransitive verb stem.)

29 ta same as 3 but here meaning *in*.

30 pasteʔ place name, possibly from -pas *to do it*, transitive verb stem + teʔ *tree*, noun.

31 k'ot *arrived to do*, auxiliary verb; a zero prefix indicates completed action in the main verb.

32 hak'betikotik *we asked it of him*, transitive verb:

h- same as in 27; morphophonemically h + h > h.

-hak' *to ask it*, transitive verb stem.

-be benefactive indirective, here meaning *of him;* cf. 45, 126, 167.

-tik same as in 27.

-otik same as in 27.

33 mi interrogative particle.

34 ʔo *there is*, particle; alternant of ʔoy. (See 37.)

35 k'usi *what, what thing*, particle.

36 spošil *its medicine*, possessed noun:

s- 3rd person possessive prefix alternant occurring with consonant-initial noun stems.

poš *medicine*, noun stem.

-il nominal suffix occurring with possessed nouns.

37 ʔoy same as 34, occurring here in its longer alternant.

38 ši *he says*, quotative particle (atonic);

[6] See footnote 5.
[7] See footnote 5.
[8] See footnote 5.

cf. 272 which is a verb form and not atonic.

39 istak *he sent for it*, transitive verb:
i- same as in 2.
-s- 3rd person subject prefix alternant occurring with consonant-initial transitive verb stems.
-tak *to send for it, to send him*, transitive verb stem.

40 ta same as 3 but here meaning *for*.

41 manel *buying*, derived noun:
man- *to buy it*, transitive verb stem.
-el same suffix as referred to in 9.

42 ta same as 3 but here meaning *in*.

43 hobel *grass*, noun stem; here used as a place named *Ciudad Las Casas*.

44 coh *it is red*, attributive predication; cf. 7.

45 lisnibbe *he spread it on me*, transitive verb:
l- same as in 25.
-i- same as in 25, but here occurs as an object prefix with the transitive verb.
-s- same as in 39.
-nib *to spread it on*, transitive verb stem.
-be same as in 32 but here meaning *on another;* cf. 126, 167.

46 yo? *place where*, particle which is always accompanied by enclitic -e at the end of the phrase. (See 5.)

47 bu *where*, particle; alternant of buy.

48 činetike same as 6.

49 ha? same as 7.

50 ?onoš *ever, always*, particle.

51 yeč *thus, it is so, like that*, attributive predication; cf. 207.

52 ?un same as 12.

53 mu *not*, negative particle.

54 ?onoš same as 50.

55 bu same as 47.

56 čkol (abbreviated form of ta škol, which also occurs) *it gets well, heals*, intransitive verb:
ta a partical which usually accompanies the prefix š-. It is probably a different morpheme from the ta of 3.
š- prefix indicating incompleted action.
-kol *to get well, heal*, intransitive verb stem.

57 čči (abbreviated form of ta šči, which also occurs) *it grows*, intransitive verb:
ta same as in 56.
š- same as in 56.
-či *to grow, spread*, intransitive verb stem.

58 tal same as 9.

59 yan *more, others*, particle.

60 ?ošib *three*, noun stem (?).

61 nan *probably*, particle.

62 šemana *week*, loan noun from Spanish semana.

63 li?ay *I had been* (in a place), intransitive verb:
l- same as in 25.
-i- same as in 25.
-?ay *to have been* (to a place), intransitive verb stem. This verb always implies that that which had gone has returned. A completed action form of the verb 'to go' (ibat *he went*) cannot be used unless that which has gone is still there. This is in contrast to English 'he went' which is ambiguous as to whether the person is still there or may have returned.

64 ha? same as 7.

65 noš *only*, particle; alternant of no?oš.

66 yeč same as 51.

67 lisut *I returned*, intransitive verb:
l- same as in 25.
-i- same as in 25.
-sut *to return*, intransitive verb stem.

68 tal same as 9.

69 mahbil *it is beaten*, attributive predication; cf. 7, 44:
mah- *to beat it, hit it*, transitive verb stem.
-bil attributivizing suffix occurring with transitive verb stems.

70 tušnuk' *cotton*, noun stem.

71 isk'an *he requested it*, transitive verb:
i- same as in 2.
-s- same as in 39.

-k'an *to request it, desire it,* transitive verb stem.

72 h?eč'el *one time,* derived noun:
h- *one,* prefixial numerative; cf. 116.
-?eč'el *passing,* derived noun stem composed of two morphemes: -?eč' *to pass,* intransitive verb stem; -el nominalizing suffix as referred to in 9.

73 yu?un same as 17.

74 ha? same as 7.

75 čič' (abbreviated form of ta šič' which also occurs; = *ta šyič') *it takes it,* transitive verb:
ta same as in 56.
-š- same as in 56.
-y- 3rd person subject prefix alternant which occurs with vowel-initial transitive verb stems. Morphophonemically the y is lost when following the prefix š-.
-ič'[9] *to take it, receive it,* transitive verb stem.

76 lok'el *coming out,* derived noun:
lok'- *to go out, come out,* intransitive verb stem.
-el same as in 41.

77 i same as 5.

78 čamele *sickness (process of dying),* derived noun + enclitic:
čam- *to die,* intransitive verb stem.
-el same as in 41.
-e enclitic, same as in 6.

79 čislambe (abbreviated form of ta šislambe, which also occurs) *he lays it on me,* transitive verb:
ta same as in 56.
š- same as in 56.
-i- same as in 45.
-s- same as in 39.
-lam *to lay it on, cover it over with,* transitive verb stem.
-be same as in 45.

80 i same as 5.

81 tušnuk'e *cotton,* noun + enclitic:
tušnuk' same as 70.
-e same as in 6.

[9] See footnote 5.

116 ča?eč'el *two times,* derived noun; cf. 72:
ča?- *two* prefixial numerative.
-?eč'el same as in 72. (? + ? > ?.)

126 istohbe *he paid it to her,* transitive verb:
i- same as in 2.
-s- same as in 39.
-toh *to pay it,* transitive verb stem.
-be same as in 32 but here meaning *to her;* cf. 45, 167.

127 yahval *its owner,* possessed noun:
y- 3rd person possessive prefix alternant occurring with vowel-initial noun stems.
-ahval[10] *owner,* noun stem.

128 cnavu (abbreviated form of ta snavu, which also occurs; = *ta šsnavu) *she spins it,* derived transitive verb:
ta same as in 56.
š- same as in 56.
-s- same as in 39. Morphophonemically the š is lost when preceding the prefix s-.
-navu *to spin it,* transitive derived verb stem composed of two morphemes: nav- alternant (occurs when a vowel follows) of no *thread,* noun stem (o > a when an affix is present); -u verbalizing suffix.

136 kič'oh *I have taken it,* transitive verb:
k- 1st person subject prefix alternant occurring with vowel-initial transitive verbs.
-ič' same as in 75.
-oh suffix occurring with transitive verbs indicating perfective aspect.

167 i?albatik *they were told it,* passive verb:
i- same as in 2.
-?al[11] *to be told it,* passive verb stem; the passive stem differs from the transitive stem in that it does not lose its initial glottal stop when prefixation occurs; it functions as an intransitive verb stem.
-b- alternant form of -be as in 32, here meaning *to them;* cf. 45, 126.
-at suffix indicating passive.

[10] See footnote 5.
[11] See footnote 5.

-ik pluralizing suffix occurring with 2nd and 3rd persons of verbs.

183 ihči?in *I accompanied them*, transitive verb:
i- same as in 2.
-h- same as in 27.
-či?in *to accompany another*, transitive verb stem.

207 yečon *I am the same*, attributive predication:
yeč- same as in 51.
-on 1st person subject suffix occurring in attributive or noun predications and with certain modes of intransitive verbs.

270 k'u *what*, particle; alternant of k'usi. (See 35.)

271 ma interrogative particle.

272 ši *he says*, intransitive verb; special unaffixed form from the intransitive verb stem -či *to say;* ši is also used commonly as a quotative, but is atonic when quotative; cf. 38.

273 batan *go!*, intransitive verb; imperative:
bat- same as in 25.
-an 2nd person suffix occurring in the imperative and certain other modes indicating condition contrary to fact.

274 mi same as 33.

275 ši same as 272.

276 ši same as 38.

277 muk *not*, negative particle.

278 bu same as 47.

279 ihk'opon *I spoke to him*, transitive verb:
i- same as in 2.
-h- same as in 27.
-k'opon *to speak to him*, transitive derived verb stem composed of two morphemes: k'op *words, language*, noun stem; -on verbalizing suffix.

280 tal same as 9.

281 yu?un same as 17.

282 lihatav *I fled*, intransitive verb:
l- same as in 25.
-i- same as in 25.
-hatav *to flee, escape*, intransitive derived verb stem composed of two morphemes: -hat *to tear it*, transitive verb stem; -av intransitivizing verbal suffix.

283 škut *I was telling them*, transitive verb:
š- same as in 56.
-k- same as in 136.
-ut *to tell it to another, say it to another*, transitive verb stem.

284 k'u same as 270.

285 htu?un *my usefulness* (*usefulness to me*), possessed noun:
h- same as in 11.
-tu?un *usefulness*, noun stem.

286 muk same as 277.

287 bu same as 47.

288 likol *I got well*, intransitive verb:
l- same as in 25.
-i- same as in 25.
-kol same as in 56.

289 čpoštavan (abbreviated form of ta špoštavan, which also occurs) *he treats, gives medicine*, derived intransitive verb:
ta same as in 56.
š- same as in 56.
-poštavan *to treat, give medicine*, intransitive derived verb stem composed of three morphemes: poš *medicine*, noun stem; -ta verbalizing suffix which forms the transitive verb stem -pošta *to treat it, him*, -van intransitivizing verbal suffix.

290 i same as 5.

291 h?ilol same as 28.

292 ?une particle + enclitic:
?un same as 12.
-e same as in 6.

REVIEWS

KWAKIUTL GRAMMAR WITH A GLOSSARY OF THE SUFFIXES. By Franz Boas. Edited by Helene Boas Yampolsky, with the collaboration of Zellig S. Harris. Transactions of the American Philosophical Society, New Series, Vol. 37, pp. 200–377 (1947). $2.50.

For almost sixty years of his life Franz Boas worked with the Kwakiutl, who live along the coasts of Queen Charlotte Sound and speak a language of the Wakashan family. These were, perhaps, his favorite Indians in that part of North America with which he identified himself from the beginning of his career. From the Kwakiutl he gathered extensive ethnographic as well as linguistic material with his characteristic persistence and love of detail. His first full-length description of the language was published nearly forty years ago, but he regarded that as a mere preliminary report.[1] Again and again, between his many other duties, Boas returned to his labors on Kwakiutl, and during the last years of his life he found it possible to devote more time and attention to this group. When he was no longer able to go into the field, he had a Kwakiutl informant live in his home for several months as a source for expanding and checking his linguistic data.

The manuscript of the present volume was practically in final shape at the time of Boas' death. His daughter, Mrs. Yampolsky, had worked with him on Kwakiutl and, after his death, filled in some of the gaps that Boas had planned to attend to and prepared the manuscript for publication, with the help and advice of Zellig Harris. One suspects that Mrs. Yampolsky was more concerned than Boas himself would have been with a phonemic organization of the original phonetic data, but the monograph remains essentially Boasian. Its major difference from the earlier grammar lies in its more thorough treatment of the morphology and its fuller presentation of examples.

The monograph begins with a two-page introduction, which defines the position of Kwakiutl, both geographically and linguistically, and points out some of the outstanding structural features of the language.

Part I constitutes the grammar proper, divided into phonology (207–219), morphology (219–280), syntax (280–295), and two brief appendices (295–299) containing notes on the Newettee (northern) and Bella Bella (central) dialects of Kwakiutl.

The vowel system is difficult to discern in its phonemic outlines. For Kwakiutl vowels, described as "very labile" in the introduction, have numerous allophones and undergo phonemic changes as part of the morphology of stem alternation. Boas' cautiousness in going beyond a phonetic transcription and his interest in the morphological machinery led him to adopt a mixed system of vowel transcription, indicating phonemes in some cases, allophonic distinctions in others, and morphophonemes in still others. The system appears to be based, however, upon three vowel qualities—front (varying between i and e), central (a), and back (varying between o and u), each being distinguished for short and long quantity. Boas indicates three levels of length, but his "very short" grade is dubious as a distinct category of three vowels; it probably represents either a single phoneme ə or a vocalic zero, actualized as ə under conditions involving stress and the character of the following consonant.[2]

The consonants include voiced, voiceless, and glottalized stops and affricatives in the following positions: p, t, c, λ, k^y (anterior palatal), k^w, q, q^w; the glottal stop; the

[1] In Handbook of American Indian Languages, Part 1, BAE-B 40.423–557 (1911).

[2] The symbols employed here will follow general usage, with explanatory notes where necessary, rather than Boas' transcription.

spirants s, ɬ, x^{y}, x^{w}, x̣ (velar), $x̣^{w}$, h, and a somewhat uncertain laryngeal ḥ, which was of rare occurrence and was not easily distinguishable from h; and the continuants w, ẇ, y, ẏ, m, ṁ, n, ṅ, l, l̇.

Two grades of stress, weak and strong, are phonemic in Kwakiutl.

As described in terms of phonetic structure, words begin in a single consonant followed by a vowel; Boas explains but does not write the glottal stop before a vowel occurring initially in the word or following another vowel. Any consonant may begin a word, but clusters do not occur in this position. The word may end in a vowel, a consonant, or two consonants. Only certain consonants and consonantic clusters, however, may terminate the word. The structure of the syllable, therefore, appears to be CV(C)(C), with a possible cluster of three consonants in word-medial position. The continuants have a dual status in the structure of the syllable: they may function either as consonantic units or, like vowels, as syllabics.

There are a few automatic changes of consonant phonemes as a result of contact. But most of the phonemic changes, including all those affecting vowels, are morphologically restricted.

Stems are classified into types based upon phonetic structure. Suffixes can also be classified phonologically into those which glottalize, those which sonantize, and those which do not affect the final consonant of the stem.

Revealing Boas' special interests are two sections of the phonology: one discusses and presents a table of the relative frequencies of Kwakiutl sounds, as obtained from speech samplings and from stem lists; the other, dealing with "sound symbolism," gives a list of seventeen stem pairs, the members of each pair being related in meaning and formally differentiated only in the presence of a glottalized consonant in one stem paralleling the homorganic unglottalized consonant in the other member of the stem pair.

In its morphological mechanics Kwakiutl operates with reduplication, internal change of both consonants and vowels, infixation or "stem expansion," and suffixation. Word classes are best described in terms of a) predicaters and b) particles and interjections. Predicaters can be further classified as static or active. Boas recognized that the distinction between noun and verb could not be readily applied to Kwakiutl, in that stems could not be divided on this basis. But he wrote that "the distinction between personal and possessive pronominal suffixes proves that the two classes (noun and verb) are distinct" (p. 205). Yet, from his examples it appears that "verbs" may append the "possesssive" pronouns (p. 274), so that the difference between verb and noun is reduced to the criterion of syntactic function.

The pronoun system is highly elaborate. Distinct sets of pronominal suffixes indicate possessor, subject, object, instrumental, combined subject-object, and combined subject-instrumental. Pronominal references distinguish 1st person, inclusive and exclusive, 2nd person, and 3rd person; the 3rd person pronouns, like the demonstratives, are differentiated for position near 1st person, near 2nd person, and near 3rd person, each of these three locations being further discriminated for visible versus invisible.

Part II (301–377) is the glossary of Kwakiutl suffixes, rich in examples and analytic detail.

Readers not intimately familiar with Wakashan will find this grammar difficult to follow, quite aside from the fact that it does not speak in the linguistic idiom of the present day. Boas was at his linguistic best in the glossary of suffixes, where he was able to work out fine details of form and meaning within the compass of a single suffix and to present the suffixes in alpha-

betical order, without venturing to seek a systematic framework in which each suffix would have its place. This fragmented approach in the grammar results in a series of separate topics, with very little logical or organic relationship between one section and another. Similarly, the manner of presenting examples does not provide an easily apprehended clarification of the point being discussed. The great majority of examples in the grammar are quoted in their full sentence context, with references to the volume, page, and line of the text in which the examples may be found. In giving the example no attempt is made to identify the formative element being discussed, the theme to which it is attached, or the other forms in the context. Without a lexical knowledge of the language, consequently, the reader is at a loss to understand clearly how the examples illustrate the topic which is being treated.

These difficulties in the way of apprehending the structural patterns of Kwakiutl arise, of course, from Boas' fundamental view of language. In his view the linguist's task was to document carefully the overt phenomena of a language, to point out obvious relationships in the phenomena, but never to intrude himself by offering theoretical rationalizations in an attempt to weld the phenomena into a more or less integrated system. The infinite mass of details in any language, therefore, could be described only in terms of disparate clusters of data. And the reader must be content, in reading such a description, to follow the same laboriously inductive path as the investigator, picking his way as best he can through the luxuriant forest of tangled details that constitutes a language.

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This is Boas' final word on the subject of Kwakiutl, a language with which he occupied himself during most of his professional career. For this reason, it is likely to be taken as the most complete exemplification of his linguistic method, and hence deserves special attention.

The book is divided into two parts: Part I, the grammar proper (207–99), and Part II, a 'Glossary of the Suffixes' (301–77). Part I is further subdivided into the usual sections on Phonology (207–19), Morphology (219–80), and Syntax (280–99), each with numerous sub-sections. The features usually considered characteristic of Boas' work are evident throughout: extensive gathering and presentation of material, and careful attention to details, particularly in phonetic transcription and in the isolation and semantic definition of morphological elements. Boas' transcription is basically phonetic, with almost no attempt at phonemicization;[1] but he notes carefully all the variant sounds, often with indication of dialectal differences. Details of phonetic description, especially in the alternations of sounds in grammatical forms, are found scattered throughout the section on morphology as well. On the other hand, as can be seen from the relative lengths of the chapters, the overt treatment of morphology is the center of attention; furthermore, morphological discussion actually begins in the middle of the chapter on phonology (216) and continues to the end of the first part. The section entitled 'Syntax' is somewhat misnamed; instead of what is usually understood by that term—the structure of combinations of free forms—Boas treats for the most part in this section, rather, the se-

[1] The lithoprint presentation of the Kwakiutl Grammar, with its typewritten symbols for small capital L and E, is rather unfortunate, since it is quite hard to read, and the characters mentioned are difficult to distinguish from iota and the raised epsilon symbolizing a glottal stop, respectively. Part of the difficulty is of course due to Boas' well-known conservatism in typographical matters (expressed somewhat polemically in the Kwakiutl Grammar 208, fn. 5).

mantic implications of various morphemes and form-classes ('passive', 'tense and aspect', 'negation', 'plurality', etc., and their expression in Kwakiutl).

The present book is unquestionably very difficult to read; we could hardly assign it to our students as a model for them to study and imitate in preparing new descriptive grammars. This is due, not only to the complexity of Kwakiutl structure, but to the organization of the Grammar itself. On my first perusal of the work and resultant bafflement, I was inclined to believe that this was due to outdated methods of analysis and presentation: e.g. Boas' well-known shyness towards phonemic analysis, his prime interest in 'grammatical processes' and morphology, and the general absence of a modern structural approach. But other grammars written long before the 1940's do not show the same obscurity (think of Whitney's Sanskrit Grammar, 1879, or Boehtlingk's description of Yakut, 1851); moreover, wherever their presentation varies from modern usage, one can usually reinterpret the material easily and re-state it in current terminology.

My perplexity vanished when I took up Boas' earlier grammar of Kwakiutl (HAIL 1.423–557 [1911]), which, although written with the same approach and technique, is far clearer and more understandable. The very organization of the 1911 sketch is more consistent than that of the 1947 work; the latter often seems like a somewhat disjointed Materialiensammlung by contrast. Much of the discussion contained in the 1911 outline has been retained in the later book, but often transposed to a different section where it makes less sense and seems out of context. On many points—e.g. the three types of suffixes, classified as 'hardening', 'weakening', and 'neutral' according to their effect on the final consonant of a preceding stem—I could interpret the data given in the 1947 Grammar only in the light of what was said in the 1911 description. Even though the more recent book adds much new material and in many respects extends the discussion of the earlier work, it remains far less approachable; this is because the later treatment implicitly assumes what Boas already had in his own brain, a thorough acquaintance with the earlier outline.

It seems clear, therefore, that we should not regard Boas' 1947 Kwakiutl Grammar as an independent work, and should not use it as an exclusive basis for our discussion or judgment of his analytical method. It is, rather, a continuation, a development, and in some measure a supplement to his 1911 description. It is to be regretted that Boas never found time to fuse and integrate the two works into a single, unified whole. When we are using Boas' work on Kwakiutl, whether for its linguistic content or as an exemplification of his methodology, we should be careful to use both volumes; we shall, of course, have to make our own synthesis. To a certain extent, therefore, Kwakiutl is now in the position that the Indo-European languages have long been in, that of having an established but incomplete grammatical tradition; the task still remains —if some analyst can spare time from rescuing the yet unrecorded American Indian languages—of doing further work with Kwakiutl informants and of re-working Boas' extensive materials, into a truly modern description.

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DICCIONARIO DE AZTEQUISMOS O SEA JARDÍN DE LAS RAÍCES AZTECAS. By Cecilio A. Robelo. Ediciones Fuente Cultural, México, D. F. (3rd edition, [1948].) 548 pp. 30.00 Pesos.

Robelo's Diccionario de Aztequismos was originally published in 1912, although the volume at that time constituted only what is now the first four hundred pages of the present work.

The present volume is divided into two principal parts: Diccionario de Aztequismos (pp. 1–501) and Nociones de la Lengua

Náhuatl (pp. 503–20). In the dictionary proper about 1600 words and 600 place-names are listed. The dictionary itself is not arranged in strictly alphabetical form, but the Indice Alfabético de Aztequismos (pp. 525–37) and the Indice Alfabético de Nombres Geográficos (pp. 538–43) provide ready alphabetical reference.

The content arrangement is by 'lessons'; lessons 1–112 are built around morphemes that appear in more than one Spanish loan, and lessons 113–30 contain Spanish loans consisting of single morphemes or containing morphemes that do not occur in other Spanish words considered.

In general, each of lessons 1–112 contains (1) the basic morpheme (whether root or affix) with a definition in Spanish and the form of the morpheme found in the words thereafter listed; (2) an alphabetical section listing the words, the form of each word repeated with hyphens to indicate the morphemes, a more or less literal translation of the word, and a description of the item involved; (3) a section listing place-names, arranged in the same manner as the section on the regular words; (4) a series of further historical and cultural notes ('Ejercicios') relative to the words described in the foregoing sections; (5) copious footnotes on the preceding sections, including comments or quotations from other authors regarding specific words, morphemes, or definitions. These footnotes may also include sentences and proverbs in Spanish using Aztec loan words to further illustrate the meaning of the word. Scientific names and descriptions of flora and fauna are also included. Sometimes a section called 'Derivados' is added which lists and defines Spanish words formed by the addition of a Spanish morpheme to an Aztec word.

The part entitled 'Nociones de la Lengua Náhuatl', included as a supplement to the dictionary, is stated to have been originally published in the Proceedings of the 18th International Congress of Americanists (1912?). It is a brief grammar of the language. First is treated the alphabet, with considerable reference to historical orthographies, and with pronunciation in terms of modern Spanish. This is followed by a section on the morphology with some attention to the inflectional endings, but with much more to the derivational formations, as would be expected in a dictionary of this type. Rules of derivation and phonological change are set up. Suffixes indicating respect or disrespect or some other mood of the speaker are treated in a section of the grammar. The derivation of geographic and ethnographic names is discussed as well. The last section of the grammar deals very briefly with accent in historic Aztec and modern Aztec loans in Spanish.

In addition to the two indexes already mentioned there are two others: Indice Alfabético de Autores and Indice General.

Although this volume is the third edition of this work, its recent publication merits the attention of scholars interested in the Aztec and Spanish languages whether modern or historic. It is to be regretted that this work is not the product of a linguist of the modern school, but in spite of this it should be of great value.

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LA ESCRITURA DEL IDIOMA NAHUATL A TRAVÉS DE LOS SIGLOS. By J. Ignacio Dávila Garibi. México, D. F., Editorial Cultura, 1948. Segunda edición, corregida y aumentada. 185 pp. $8.00 (Mex. Cy.)

This second edition is a revised and enlarged version of a lecture bearing the title "La escritura del idioma náhuatl a través de los siglos" read by the author in October, 1934 and printed later in the Memorias y Revista de la Academia Nacional de Ciencias "Antonio Alzate" 54.223–309 (1937).

Nahuatl is an American Indian language with 400 years of alphabetic tradition, preceded by several centuries of aboriginal hieratic writing. Dávila Garibi surveys the literature on Nahuatl orthography, inject-

ing a great deal of additional material and interpretation from personal observation and experience.

By way of introduction, the author outlines the steps which ultimately led to alphabetic writing in the Old World: (1) pictography, (2) ideography, (3) syllabic systems, and (4) alphabetic writing. Mention is also made of the ancient Mexican nepohualtzitzin, reminiscent of the Peruvian quipus—a mnemonic device consisting of cords of different sizes and colors, knotted in various ways to record statistics.

The Conquistadors found among the Nahuas a largely pictographic type of writing recording activities and events by drawing and coloring representative persons and objects. Phonetic elements, however, were employed in symbolizing the names of persons and places in the manner of a rebus. Graphic representations of names were integrated by realistic drawings of picturable objects representing one or more phonetic syllables; that is, two or more signs could be combined to yield a name in terms of their sound value alone.

Several names are reproduced from the Mexican codices to demonstrate the use of phonetic signs. Coatlan, for example, is symbolized by a snake (coatl) resting on two teeth (tlantli *tooth*). Arrow points of obsidian (itztli *obsidian*) piercing a snake represents Itzcoatl. A rabbit head (tochtli *rabbit*) protruding above a mountain top (tepetl *mountain*) denotes Tochtepec. The nominal ending -tl(i) is dropped from a prior member in composition, and final -c in the last example, a locative suffix, does not figure in the script. There appears to be no special disposition of the phonetic parts: they may be arranged so as to be read from right to left or from left to right, from below upwards or from above downwards; or one phonetic element may be placed within another.[1]

[1] The same author gives a clearer notion of phonetic signs in Aztec writing in another work entitled Epítome de Raíces Nahuas. México, D. F. (1949). 2d. ed., vol. 1, pp. 77–86.

Shortly after the Conquest the Spanish missionaries attempted to utilize the graphic resources of the Nahuas, sometimes referred to as hieroglyphs, in religious instruction to the natives. One version of the Pater Noster began, for example, with the outline of a flag followed by drawing of a prickly pear, because of the sound-resemblances to the Nahuatl vocables pantli *flag* and nochtli *prickly pear*. In another version efforts were made to reproduce the words syllabically: Pater Noster was represented by symbols for pantli + tetl *stone* + nochtli + tetl, and read pa-te-noch-te. A purely pictographic version showed first a priest standing, then the upper part of the same priest inside a concentric circle which represented Heaven; both figures taken together must have received an interpretation something like totatziné in ilhuicatl timoyetztica *Our Father, which art in Heaven;* here there is no correlation between sound and symbol.

The hieroglyphic writing of the Nahuas proved difficult and complicated for the Spaniards; thus we find that all the codices which fell into their hands had to be annotated with explanatory notes. Hieroglyphic writing soon gave way to Roman characters, declared official in all of New Spain. By suppressing certain letters used in Spanish orthography without Nahuatl counterparts, a fairly workable writing system evolved. During the first years of Spanish domination the missionaries made use of 19 single letters and 4 digraphs: a, c, ç, ch, e, h, i, j, l, m, n, o, p, q, t, tl, tç, tz, u, v, x, y, z. In the Spanish orthography of the time there was a considerable number of inconsistencies between sound and symbol, which affected Nahuatl orthography accordingly. In addition, dialectal differences—Basque, Galician, Catalan, etc.—exerted influence on Nahuatl orthography.

Spanish practice was followed in the use of "hard" c and q: acatl *reed-grass*, qualli *good*, qüeitl *skirt*. v represented the first part of a rising diphthong, slightly preaspirated in the author's opinion: vei, vel, veve, nowadays usually written huey *large*,

huel *very*, huehue *old;* some dialectal differences connected with v are noted below. h marked prevocalic and postvocalic aspiration (and probably postaspirated glottal stop in some dialects). ç frequently replaced "soft" c or z, apparently according to the orthographical habits or the taste of the particular writer: Zacatecas or Çacatecas, çã or zan; Olmos (Gramática de la Lengua Mexicana, 1547) often employed ç in the digraph tç instead of the usual tz. y served both as a syllabic and as a non-syllabic: ycampa *behind*, yancuic *new;* Molina (Vocabulario de la Lengua Mexicana, 1555) alternated i and y in word initial. Sahagún substituted j for i; in the Codex Florentino words are found written jc, injc, mjtoa, etc. In several of his works, Sahagún used the tilde over y: ȳmetztli ȳmixtli. (A characteristic Spanish practice of the time was to write a tilde over a vowel to indicate a following nasal). Hispanicisms in prayers and Christian doctrine brought on the introduction of 5 additional letters: d, j, r, s, and f.

Toward the middle of the 17th century v began to fall in disuse, also j with syllabic value, and ç, especially in the combination tç. This Nahuatl "gramatorio", or inventory of symbols, thus reduced to 16 single letters and 3 digraphs, still finds favor among the majority of those who propagate the language today.

From the end of the 18th century v completely disappeared in Nahuatl records. ç continued in vogue among a small nucleus of traditionalists; even in the present century ç has appeared in a few publications.

The last third of the 19th century marks a series of orthographical changes which have been vigorously extended in the 20th century; alphabet simplification in many countries began to take on a greater body of supporters. As for Nahuatl, the trend was more and more toward sound-symbol correspondences (actually, in most instances, toward phonemic transcription). Francisco Pimental pointed out in 1862 the convenience of reestablishing the use of v in place of hu, contending that a single symbol is more practical than two. He also tried to introduce k in place of "hard" c and q. In this second proposal he found a number of supporters. Remí Simeón favored reducing the orthography to 13 letters, since "hard" c and q could be replaced by k, and c and z, i and y, o and u, by a single symbol for each pair. Another suggested reform was the replacement of hu by w. Several writers substituted s for "soft" c and z, particularly in transcribing contemporary dialects. Others, bound by tradition, continued with c and z.

With documentary support from early grammars, the author believes that in the epoch of the Conquest, the dialects of Nahuatl treated by the missionaries had a spirant unlike Spanish s, which they sometimes represented by z, sometimes by c, and other times by ç. In the course of time the sound changed, at least in the dialects in and around the Valley of Mexico. Today the sound is identified with Spanish s.

Only 9 single letters and 3 digraphs remained current, accepted by most Mexicanists, both the partisans of orthographical reform and the traditionalists: a, e, i, l, m, n, o, p, t, ch, tl, and tz. The choice of other letters rested with the individual writer. The Academia de la Lengua Nahuatl recommended c, q, z, x, y, z, and the continued use of hu.

Early in the 20th century some authors introduced the use of sh in place of x. ł was suggested to replace ll, and č to replace ch. Several writers suppressed word-initial h.

The first Asamblea de Filólogos y Lingüístas held in Mexico City in May, 1939, pointed the way to simple, concise, phonetic alphabets for writing American indigenous languages. The suggested substitutions for Nahuatl were č for ch, š for x, λ for tl, ȼ for ts, k for "hard" c and q, s for z and "soft" c, w for hu, ʔ for glottal stop, and · to indicate long vowels. The Consejo de Lenguas of the Secretaría de Educación Pública has recommended the use of the alphabet recognized by the Academia de la Lengua Nahuatl for linguistic studies

dealing with early sources, and the phonetic or "scientific" alphabet for studies dealing with present-day dialects and works for popular divulgation.

Of transitory occurrence in the transcription of Nahuatl, h has sometimes been replaced by g before ua, üe, and üi, and by j in syllable final; also tz by ts.

The most flagrant inconsistencies are found in the use of diacritical marks. Acute, grave, and circumflex accents, horizontal, vertical and slanting bars, the colon, semicircles, the tilde, single dots, the apostrophe, and the dieresis, have been used with varying significance. A number of authors failed to indicate what their diacritics represent. Accent marks for the most part have served to denote stress, intonational features, vowel quality, syllable length, and glottal stop. Additional diacritics indicate phonetic phenomena peculiar to the individual author.

Anarchy has to a large extent ruled in the matter of orthographical symbols; this imposes on the reader of works in Nahuatl the considerable task of finding out what the criterion of each author has been. The present volume helps to obviate this difficulty.

Taking this sketch together with a certain amount of research on 16th century Spanish pronunciation and orthographical habits, one could approximate the unit phonemes of "Classical" Nahuatl. A number of problems exist, however. 16th century Spanish orthography appears to have been farther from phonemic writing than the present-day orthography. For example, u and v were often interchanged; ch sometimes had the phonetic value of k. Several individual sounds were represented by two or more letters: c and q; x, j, and g; c, ç, and z. The sound or sounds shown graphically in the early Nahuatl grammars by "soft" c, z, and ç at present are identified with Spanish s. Dávila Garibi argues that if there had been an equivalent to Spanish s in Nahuatl at the time, the missionaries would have employed s, as they did in Cahita, Teguima, Maya, Tzeltal, and other native languages. The glottal stop was sometimes ignored in writing and other times represented by h. More recently the glottal stop has often been indicated by an accent mark. The sounds represented by o and u were probably allophones of a single phoneme. There were apparently two velar stops, k and k^w. Significant vowel length seems to be pretty well established; where long vowels have been recognized they have most often been transcribed traditionally as geminate vowel clusters. The other phonemes probably correspond closely to the usual symbolization shown in the phonetic alphabet of the Consejo de Lenguas.

Some orthographical incongruences must have been due to dialectal variation within the Nahuatl-speaking area itself. Statements from several grammars are cited concerning the letter v: it was reported as a labio-dental and as a bilabial fricative, as well as equivalent to Spanish hu before another vowel.

This volume suffers from inadequate proof-reading. Diacritics employed by certain authors are described, but in citing examples, the diacritics are omitted (pp. 138–139). A number of glaring inaccuracies are made in quoting passages from English (pp. 71, 84, 85–86).

Accompanying the text are 6 pages of illustrations, namely phonetic elements in the aboriginal script reproduced from the codices, two pictographic versions of the Pater Noster, and a few odd-shaped graphic symbols which attained very limited acceptance. In addition, there is a bibliography of the works cited in the text and a "Cuadro Alfabético Comparativo", listing several "grammatorios" under the headings (1) Autores Primitivos, (2) Dr. Hernández, (3) Alfabeto Tradicional, (4) Academia de la Lengua Nahuatl, (5) Siglo XIX, (6) Siglo XX, and (7) Alfabeto Fonético, Consejo de Lenguas.

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MAZATECO WHISTLE SPEECH. By George M. Cowan. Language 24.280–86 (1948).

HUASTECO INTONATION AND PHONEMES. By Raymond S. Larsen and Eunice Victoria Pike. Language 25.268–77 (1949).

DICCIONARIO ESPAÑOL-TZOTZIL, TZOTZIL-ESPAÑOL. By Kenneth Weathers and Nadine Weathers. Summer Institute of Linguistics, 1949. Multigraphed, pp. v, 28, 24.

THE ACCOUNT OF A PUNITIVE SENTENCE. Introduction and translation by Arch McKinlay. Tlalocan 2.368–73 (1948 [printed 1949]).

THE LACANDÓN SONG OF THE JAGUAR. By Phillip and Mary Baer. Tlalocan 2.376 (1948 [printed 1949]).

TEXTOS FOLKLÓRICOS EN ZOQUE. TRADICIONES ACERCA DE LOS ALREDEDORES DE COPAINALÁ, CHIAPAS. By William L. Wonderly. Revista Mexicana de Estudios Antropológicos 9.135–63 (1947 [printed 1948]).

NUCLEAR STRUCTURES IN LINGUISTICS. By Richard S. Pittman. Language 24.287–92 (1948).

THE IDENTIFICATION OF MORPHEMES. By Eugene A. Nida. Language 24.414–41 (1948).

MORPHOLOGY: THE DESCRIPTIVE ANALYSIS OF WORDS. By Eugene A. Nida. Second and completely new edition. University of Michigan Publications, Linguistics II. Ann Arbor: University of Michigan Press, 1948. Pp. xvi, 342.

PHONEMICS: A TECHNIQUE FOR REDUCING LANGUAGES TO WRITING. By Kenneth L. Pike. University of Michigan Publications, Linguistics III. Ann Arbor: University of Michigan Press, 1947. Pp. xvi, 254.

TONE LANGUAGES: A TECHNIQUE FOR DETERMINING THE NUMBER AND TYPE OF PITCH CONTRASTS IN A LANGUAGE, WITH STUDIES IN TONEMIC SUBSTITUTION AND FUSION. By Kenneth L. Pike. University of Michigan Publications, Linguistics IV. Ann Arbor: University of Michigan Press, 1948. Pp. xii, 187.

COEXISTENT PHONEMIC SYSTEMS. By Charles C. Fries and Kenneth L. Pike. Language 25.29–50 (1949).

APPROACHING READING THROUGH THE NATIVE LANGUAGE. By Eugene A. Nida. Language Learning 2.16–20 (1949).

ACCELERATING LITERACY BY PIECEMEAL DIGESTION OF THE ALPHABET. By Elaine Mielke Townsend. Language Learning 1, no. 3, 9–19 (1948).

CONTROLLED INFANT INTONATION. By Evelyn G. Pike. Language Learning 2.21–24 (1949).

LA OBRA DEL INSTITUTO LINGÜÍSTICO DE VERANO EN MÉXICO. By William L. Wonderly. Boletín Bibliográfico de Antropología Americana 10.64–70 (México, 1948).

This review concerns works of linguistic nature written by members of the Summer Institute of Linguistics, which have appeared during the past year (exclusive of papers published in IJAL and of pedagogical, Biblical, and other materials for use primarily by native speakers of Indian languages). Also included are two books that were mentioned in this column previously but which are again included here for the purpose of providing information as to the American Indian languages treated in them.

Cowan gives a description of the whistled speech used by male speakers of Mazatec under certain cultural circumstances. The whistled speech, which is devoid of segmental phonemes, is shown to be based on the four-register tone system of Mazatec and to closely parallel, syllable by syllable, the spoken language. By the omission of the segmental phonemes which normally distinguish certain tonally identical forms, the whistled speech contains a greater number of homophones than the spoken language; despite this, there are no known lexical limitations to the whistled forms, although there is greater dependence on cultural context to avoid ambiguities. A page and a half of whistled texts is given, each whistled utterance being followed by the corresponding spoken form and a translation. A footnote also mentions the existence of whistled speech in Zapotec. To this reviewer, the article raises a question as to

the validity of assigning to the tonemes a function subordinate to that of the vowel nuclei, as done by Pike and Pike[1] and as implied by our traditional term 'suprasegmental'. That is, does the fact that the tone registers alone, unaided by segmental phonemes, may constitute a language indicate that the tonemes are more basic? Or does it indicate merely a historical accident that has taken place in the culture—an accident which might just as well have given the opposite result if the Mazatecos had adopted an auxiliary system using segmental phonemes only (e.g. a written orthography which failed to mark tone)?

The paper on Huastec intonation is probably the first detailed structural analysis that has appeared of the intonational system of an American language. The system is basically quite different from the English intonation system, although many of the techniques used in analyzing English were also useful in analyzing and describing Huastec intonation. Methodologically, Larsen and Eunice Pike have made a contribution by successfully describing the system first in terms of intonation phonemes and allophones (meaningless units) and then separately, in terms of intonation morphemes and morpheme alternants (the meaningful combinations of intonation phonemes), thereby presenting their materials in a way that closely parallels modern structural statements of phonemic and morphological systems in the general sense. The intonation analysis of Huastec is seen to be interlocked with an analysis of certain non-intonational features of stress and length, and to provide the key for a satisfactory analysis of the latter; this suggests that for other Mayan languages as well, and probably for American Indian languages in general, an analysis of intonation is a desideratum or even a prerequisite to a satisfactory statement of the suprasegmental phonemes and allophones.

The Tzotzil dictionary is designed primarily for the use of natives who desire to learn Spanish, and of school teachers who need to learn Tzotzil. It is in a phonemic orthography adapted to Spanish symbols, and thus is also useful to the linguist. Verb forms are cited with the third person singular prefix; in the Tzotzil-Spanish section however, the prefixially bound stem forms are also shown, and form the basis for their alphabetic listing. The Tzotzil-Spanish section contains about 515 entries, plus numeral forms which are given in a separate list at the end.

McKinlay presents a copy of a contemporary Nahuat manuscript used by dancers in the town of Xalacapan, Puebla, Mexico. The text represents a dialect different in part, but adapted to, the Xalacapan dialect of Nahuat. The text is preceded by a brief description of the dance and followed by a free translation in English.

The Baer paper consists of a brief Lacandon hunting song (without music) in phonemic transcription followed by literal and free translations in English.

The Zoque texts collected by Wonderly consist of 18 episodes and descriptions, mostly dealing with supernatural features or happenings believed to be associated with certain places in the region named. These are in phonemic transcription with a semi-literal translation.

Pittman, assuming the validity of the principle of immediate constituents, attempts to codify the criteria that are generally used in determining relative rank (subordination) in linguistic analysis. Ten criteria are listed, including some which are considered as diagnostic, others which are given as supporting criteria. The criteria, in the order discussed, are: independence, class size, versatility (range), endocentricity, class frequency, individual frequency, prosody, length, meaning, pattern. Examples

[1] Kenneth L. Pike and Eunice Victoria Pike, Immediate Constituents of Mazateco Syllables. IJAL 13.78–91 (1947).

are cited from Nahuatl to illustrate certain of these criteria.

Nida takes issue with Bloch and Hockett in their rigid application of certain principles of morphemic analysis; he then proceeds to outline a series of principles which, while conforming in many respects to current morphemic theory, contribute several refinements and changes which appear necessary for an adequate treatment of certain problems that arise in morpheme identification. Complementary distribution as a criterion for inclusion of different forms under one morpheme is delimited more closely than in previous treatments of the subject which have appeared. Overt formal differences are assigned morphemic status in precedence over covert (zero) differences, especially where the former provide a minimal contrast; this differs especially from Bloch's treatment of similar problems in English. Hockett's concept of portmanteau morphs is replaced by two principles: that two allomorphemes may be partially or completely coexistent, and that a single morpheme may be tactically equivalent to two or more morphemic categories. Certain problems of overdifferentiation of meaning which were handled by Bloch by setting up series of homophonous or near-homophonous morphemes are here treated under principles that admit sub-morphemic differences of meaning as conditioned by the distribution of allomorphs. Criteria are here given for the equation or non-equation of semantically related forms as allomorphs of the same morpheme. The final section lists types of morphemes. American languages cited as illustrative material in the article are Huichol and Makushi.

Nida's new edition of Morphology, unlike his first edition, centers around the morpheme and its allomorphs as basic to descriptive methodology. This new emphasis gives rise to a different organization of the book; the chapter headings are: (1) Introduction to Morphology, (2) The Identification of Morphemes, (3) Types of Morphemes, (4) The Distribution of Morphemes, (5) Structural Classes, (6) The Meaning of Morphemes and Sequences of Morphemes, (7) Field Procedures, (8) Analytical Procedures, (9) The Descriptive Statement of the Morphology. Chapters 2 and 3 parallel, with certain rearrangements and amplifications, the materials in the article on The Identification of Morphemes listed above. Chapters 4 and 5 include the treatment of tactics, and chapter 6 discusses problems of semantics. The remaining chapters are devoted to practical problems of field work, analysis, and the writing up of descriptive materials. Another new feature of this edition is the use of problems and more illustrative data from actual languages: There are practice problems based on data from the following American languages: Aztec, Chatino, Cuicatec, Eskimo, Futa-Fula, Huave, Huichol, Kekchi, Mam, Mazahua, Mazatec, Navaho, Otomi, Pame-Chichimeca, Popoluca, Quechua, Tarahumara, Tarascan, Tlapanec, Tojolabal, Tonkawa, Totonac, Tzotzil, Tzeltal, Zapotec, Zoque.[2] Most of these are from primary sources. Allusions, including illustrative material in a number of cases, are also made to Cherokee, Chipewyan, Chiricahua Apache, Chitimacha, Chontal of Oaxaca, Comanche, Hupa, Maya, Muskogee, Nootka, Potawatomi, San Blas, Southern Paiute, Taos, Yuma.

Pike's Phonemics has been cited before in this Journal;[3] we here list the American languages for which items of data are given in the book. These are: Aymara, Aztec, Cakchiquel, Chol, Huichol, Mazateco, Mixteco, Oaxacan Chontal, Popoluca, Que-

[2] Zoque data are from this reviewer's field notes, but one morphemic interpretation is different or may be the result of an oversight: the incompletive suffix -pa (correctly listed on p. 17 with allomorphs -pa ~ -p. . .a) is listed on p. 206f. with allomorphs -pa ~ -p. The -p allomorph appears not to be substantiated by the data.

[3] See IJAL 14.59-60 (1948), 15.75-85, 89 (1949).

chua, Shipibo, Tabascan Chontal, Totonaco, Zapoteco, Zoque. Data for these languages are mostly in the form of phonemic practice problems based on restricted data; they are from primary sources for the most part. References are also made to secondary sources on Cuicateco, Kickapoo, Maya, Navaho, Tzotzil. This reviewer's paper on Phonemic Acculturation in Zoque (IJAL 12.92–95 [1946] is reprinted on pp. 202–16 of Phonemics.

Pike's Tone Languages is here mentioned again[4] to call attention to the descriptive material it contains on American languages. Following the theoretical material, the last two chapters amount to monographs on two tonemic systems of Mexico. Chapter 7 (pp. 77–94) is entitled Tonemic Perturbations in Mixteco, with Special Emphasis on Tonomechanical Subclasses. The chapter is divided into sections on dissyllabic toneme forms and tonemes of monosyllables, with tonomechanical subclasses under each. A sample text with tonemic annotations is given. Chapter 8 (pp. 95–165) is entitled Tonemic Perturbations in Mazateco, with Special Emphasis on Tonemic Fusion. The chapter first treats tonemes of nouns and noun phrases, then tonemes of verbs; a sample text is given. Other American languages mentioned or briefly treated are: Amuzgo, Apache, Chatino, Cherokee, Chinanteco, Chocho, Cuicateco, Matlazinco, Maya, Muskogee, Navaho, Otomi, Pamé [sic], Takelma, Taos, Tlapaneco, Tlingit, Trique, Tunica, Zapoteco.

Fries and Pike present the thesis 'that two or more phonemic systems may coexist in the speech of a monolingual', and proceed to give a procedure for analyzing such coexistent systems. The paper begins with an illustration from Mazatec to demonstrate that monolingual Mazatec speakers have two conflicting systems at one point in their phonemics. Such duality in phonemic systems may arise from loan words, stylistic differences within a given speaker's usage, specific morphemes that do not fit the regular system of the language, etc. The procedures given, even when loan words are involved, are on a synchronic level and include the drawing of certain structural implications from objective observations of the native speaker's reactions and difficulties in learning to write his language, in attempting to analyze his language, and/or in learning a second language. The assumption of nonuniformity of systems within a given speaker's language leaves the way open for the postulation of intermediate stages between two systems related in time; and thus may well provide a basis for a closer drawing together of our techniques for historical and descriptive linguistics. Illustrations from Cakchiquel and Zapotec are also cited in the paper.

Nida's article in Language Learning discusses the problem of teaching people to read in a trade language which is not their native language. He cites developments in the attitude of the Mexico government toward utilizing the Indian languages as a means to literacy and in turn to the learning of Spanish. Recent trends include publication of primers and introductory books in the Indian languages, use of the indigenous languages in the schools, and the encouragement of diglot publications. Similar developments are cited in the United States toward using Navajo for literacy training, content education, and ultimate learning of English. Mention is made of similar tendencies in Peru for the Quechua and Aymara areas, and also in other parts of the world. Values of this approach, and technical requisites for it, are discussed.

Elaine Townsend's article discusses the problems of primer formation and the use of primers in teaching illiterates; a section is devoted to various types of reading games, some of which are shown in illustrations. The article is written as a result of experience in literacy work among Indians of Mexico and Peru.

[4] Cf. IJAL 14.59–60 (1948), 15.89 (1949).

Evelyn G. Pike reports an experiment performed in connection with her child's first learning of English, in which the parents used certain intonation patterns on certain words; the intonation was mimicked and became associated with these words from the child's first utterance of them until the same words were later heard with other intonation patterns. Children learning Mixtec, a language with lexical tone, were observed similarly to learn from the beginning the correct tone patterns of their first words. Within the limitations of the data in the article, it may be inferred that children tend to learn to produce and utilize pitch phonemes before they master many of the segmental phonemes.

Wonderly's brief resumé of the work of the Summer Institute of Linguistics in Mexico is devoted chiefly to an abstract of 36 items on Mexican Indian languages and cultures written by members of the Institute and published in 1946–47. Most of the items that are of linguistic nature have already been reviewed in IJAL or are articles that were published in IJAL.

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